

# TECHNOLOGY

## REVIEW

*January 1958*



# technology review

Published by MIT

This PDF is for your personal, non-commercial use only.  
Distribution and use of this material are governed by copyright law.  
For non-personal use, or to order multiple copies please email  
[permissions@technologyreview.com](mailto:permissions@technologyreview.com).



# Right off the Wire

An all-electronic telephone exchange (said to be the first for commercial use) has no moving parts, is noiseless and can be used in explosive atmospheres. It includes a "memory" which will hold an incoming call.

Wire can be strung beside a railroad track by a new travelling crane at the rate of 60,000 feet per hour.

Simplex recently completed one of the largest and heaviest shipments of cable ever transported on one reel — nearly two miles of ANHYDREX XX insulated submarine cable weighing 60 tons.

A new rubber-like material is porous, but will contain liquids.

Boron, lithium, hydrogen peroxide and fluorine compounds are to be the fuels of a new bomber reported to be in the design stage.

Smog-causing chemicals from automobile exhausts can be eliminated by a chemical catalyst developed by an automobile manufacturer.

Improvements in the explosive rivet have made it noiseless.

Only the touch of a hand is needed to light a new lamp. The electricity in the hand does the work.

Thorium is about three times as plentiful as uranium. A new process for the production of reactor-grade thorium should lead to a reduction in the cost of atomic fuel.

A high-output ultraviolet lamp, for heating and air-conditioning ducts, is claimed to be 1,000 times more effective in killing viruses and bacteria than an equal amount of radiation from the sun.

The world's largest solar furnace is to be completed in 1959. It will produce temperatures as high as 8,000°F, which is about 70% of the temperature of the sun's surface.

An ultra-hard glass has been developed that retains its hardness up to 1508°F.

The cost of converting sea water to fresh water has been reduced from \$1.50 to 60 cents per thousand gallons.

"Talk-back TV", a new advance in educational television, enables a pupil to ask questions of a teacher who is broadcasting from a distant room.

Scientists have been able to produce shock waves with speeds of more than 100,000 mph (above Mach 150) involving temperatures higher than 100,000°F.

Some 1958 automobiles are using aluminum instead of copper in battery cables.

The first deep sea telephone cables to utilize the revolutionary new Bell Laboratory vacuum tube repeaters were manufactured by Simplex. Minimum tube life is expected to be 20 years.

Danish trawlers are using nylon propellers. The four-foot, three-bladed size weighs only seven-tenths of a pound and they reduce vibration, resist impact damage and corrosion.

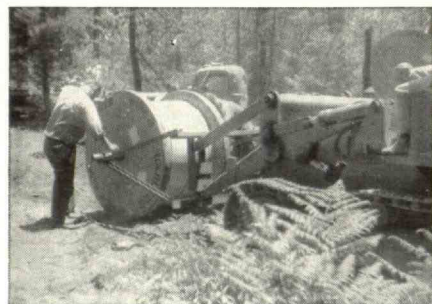
A cell that generates electricity by the chemical action of oxygen and hydrogen has been announced. It avoids some of the disadvantages of both dry cells and storage batteries.

An airplane has been built which can change its shape while in flight for the purpose of testing aerodynamic configurations.

C-L-X (Sealex) is the name of a new, completely sealed, corrugated metallic cable sheath manufactured by Simplex. It is pliable, moistureproof, and permits cable engineers to select the most economical cable cores, while assuring the greatest mechanical protection available.

Observations of the aurora during the Geophysical Year show that it occurs simultaneously at both the North and South Poles. This definitely identifies it with the earth's magnetic field.

A miniature battery about the size of a paper clip is said to deliver a steady flow of current for 176,000 hours.



## Shirtsleeve Service

Simplex recently completed an order for 4600 ft. of Anhydrex XX Parkway Cable. The Simplex man was on the spot to help with installation, which happened to be on a 9,500 ft. mountain in rough terrain. He helped design a reel mounting bracket (for holding up to 7200 lbs.) for the front of the tractor used for laying. He supervised the laying of two lengths 2200 feet long.

This case typifies the kind of cooperation that Simplex offers in order to assure correct installation and satisfactory service.

## SIMPLEX WIRE & CABLE CO.

Cambridge, Massachusetts and  
Newington, New Hampshire

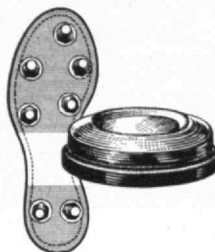
# Simplex

High quality cables for: Mining  
Power & Lighting • Construction  
Transportation • Communications  
Signalling



*... pipes or purses*

*... cleats or clay pigeons*



*... galoshes or golf balls*

## Better Products begin with CABOT!

Whether they're smoked, shot at, or whacked with a 2-iron, products containing Cabot raw materials contain a precious plus.

The plus comes from 75 years of Cabot know-how... three quarters of a century spent in intimate association with industry, its markets, and its problems. From this rich storehouse of experience... from the wide variety of Cabot raw materials... may come the product plus you've been looking for.

Whatever you make, it costs nothing to find out if Cabot can put a plus in your product. Why not put a call in... today?

### WHICH OF THESE CABOT MATERIALS CAN HELP YOUR PRODUCT?

**CABOT CARBON BLACKS**... more than 45 different grades of channel, furnace and thermal blacks for use by the rubber, printing ink, paint, varnish, lacquer, enamel, plastics, paper, phonograph record, battery and other industries.

**WOLLASTONITE**... as a paint pigment, this white, uniform calcium metasilicate, has more desirable properties than other extenders used singly or in combination. Excellent for ALL types of paint, and for the quality improvement of wall tile and semi-vitreous ceramics.

**CAB-O-SIL®**... this unique colloidal silica, in extremely small quantities, greatly improves large numbers of products. The best flow control agent available, it's especially remarkable for its

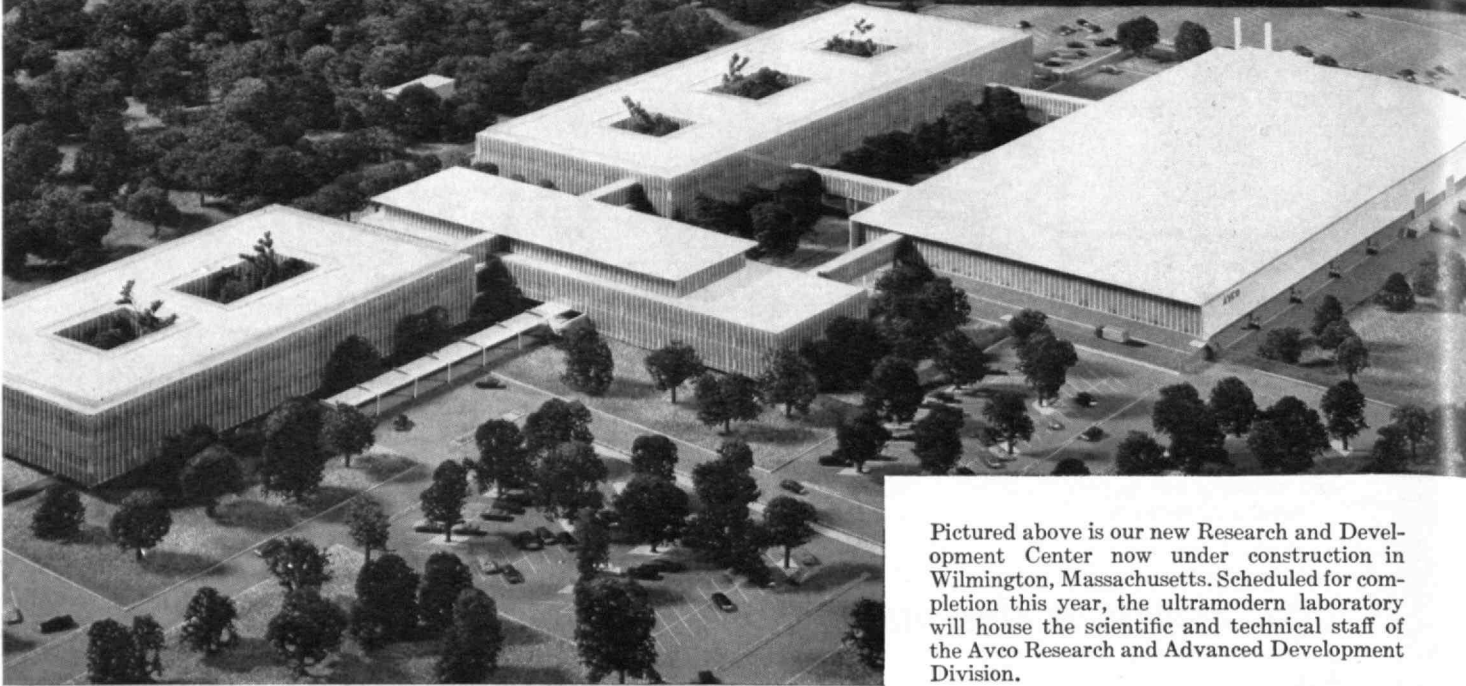
unusual combination of properties. Used for rubber, paint, varnish, printing ink, plastics, lubricants, cosmetics, many other products.

**PT® PINE TAR PRODUCTS**... these versatile quality controlled materials improve the performance of a wide variety of products, including: rubber, paint, cordage, oakum and insecticides.

For complete information, phone or write:

**GODFREY L. CABOT, INC. CABOT**  
77 FRANKLIN ST., BOSTON 10, MASSACHUSETTS  
Phone: Liberty 2-7300





Pictured above is our new Research and Development Center now under construction in Wilmington, Massachusetts. Scheduled for completion this year, the ultramodern laboratory will house the scientific and technical staff of the Avco Research and Advanced Development Division.

# Science and Progress at Avco—1957

Truly significant discoveries and technical progress are the goals of the Avco Research and Advanced Development Division. Some of the Avco RAD record of accomplishments are contained in professional papers in scientific and technical journals. Much of it is classified for reasons of military security. But the following public announcements serve to outline some of the steps taken by RAD—the “Breakthrough” Division of Avco—in pursuing its goal for 1957:

- February 11, 1957** . . . . . Site Prepared for Avco RAD Center
- April 5, 1957** . . . . . Avco to Make Hypersonic Shock Tubes for Industry, Universities, Other Research Groups
- July 1, 1957** . . . . . Avco to Develop New Radio Pack Set for Marine Corps
- July 2, 1957** . . . . . Prime \$111 Million Contract Announced for Development by Avco of Nose Cone for Intercontinental Ballistic Missile
- August 28, 1957** . . . . . Avco Shock Tube Research Has Produced Theoretical Breakthrough on 5000-Mile Air Force Ballistic Missile
- November 23, 1957** . . . . . Tiny “Building Blocks” Revolutionize Computer Design and Construction
- December 3, 1957** . . . . . Avco to Build Air Force Combat Computer

Avco's record during the past year is significant from scientific, technical and business points of view. It has been made possible by sustained effort at RAD to maintain an atmosphere conducive to creative thinking and production of the highest order.

# AVCO

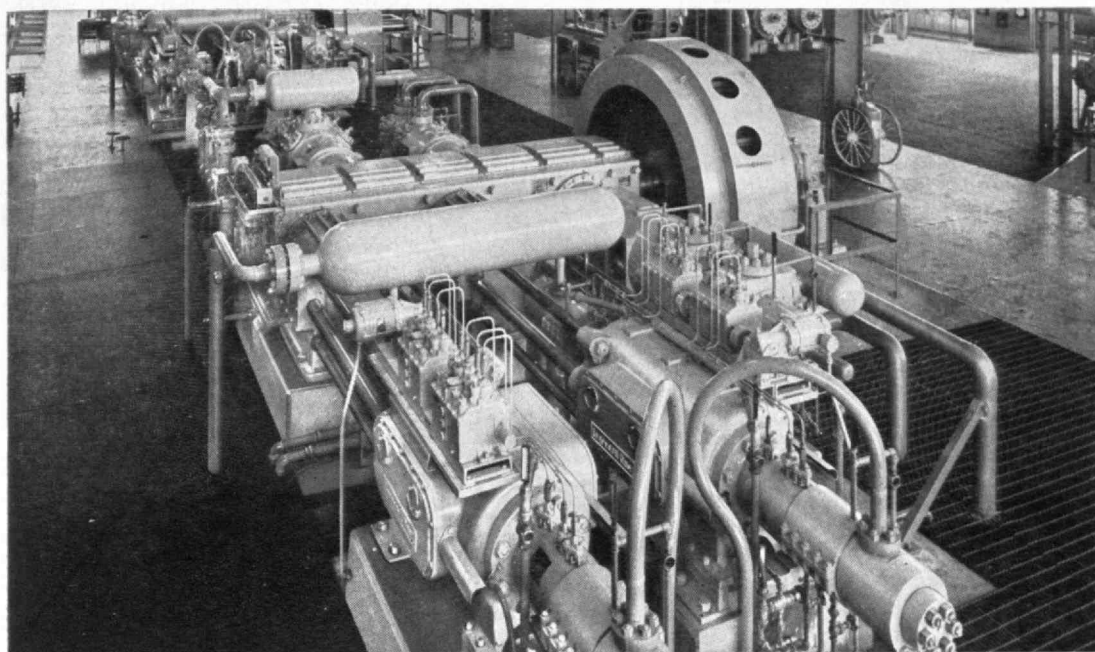
Research & Advanced Development

Avco's new research division now offers unusual and exciting career opportunities for exceptionally qualified and forward-looking scientists and engineers.

Write to Dr. R. W. Johnston, Scientific and Technical Relations, Avco Research and Advanced Development Division, 20 South Union Street, Lawrence, Massachusetts.



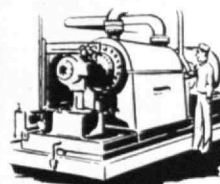
## with **INGERSOLL-RAND**



Seven electric-driven Ingersoll-Rand reciprocating compressors totaling 21,900 horsepower are at work in this large ammonia synthesis plant. The units in the foreground compress mixed gases to more than 12,000 pounds per square inch.



also means  
**LEADERSHIP**  
in



Centrifugal Pumps

### Here's What Compressor Engineering at Ingersoll-Rand can mean to you...

**T**ODAY, air power is one of the industry's most vital requirements. Compressed air and gases are the "breath of life" to chemical and process industries, refineries, power plants, steel mills, manufacturing plants, mines and all types of construction jobs. Hence, compressor and blower engineering offers an exciting and ever-expanding field of challenging opportunities that are virtually industry-wide.

Ingersoll-Rand is the world's largest manufacturer of air and gas compressors and Turbo-Blowers — supplying over 1000 different sizes and types, ranging from 1/2 hp to

17,250 hp, in pressures from vacuum to 35,000 psi.

Ingersoll-Rand also manufactures pumps, rock drills, diesel and gas engines, vacuum equipment, blowers, air and electric tools and specialized industrial machinery as illustrated at the right. These products require engineering know-how in their design, manufacture and field application.

If you are looking for a leadership career with long-range job security and excellent opportunities for advancement, you'll find it at Ingersoll-Rand. For further details, contact your Placement Office, or write to Ingersoll-Rand, 11 Broadway, New York 4.



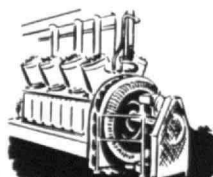
Rock Drills



Air & Electric Tools



Steam Condensers



Diesel & Gas Engines

#### OPPORTUNITIES for ENGINEERS NOW AVAILABLE:

- Sales Engineering
- Production Engineering
- Design Engineering
- Business Engineering

# Ingersoll-Rand

1-711

11 Broadway, New York 4, N. Y.

Among the many graduates of Massachusetts Institute of Technology at Ingersoll-Rand are:  
L. C. Hopton, 1926, First Vice-President and Secretary; P. J. Bentley, 1925, Vice-President.

**Instron—  
the  
tester  
that  
stretches  
dollars**



*Testing equipment dollars, that is. Here's how:*  
in testing metals, plastics, rubber, textiles, wire, adhesives,  
and many other materials, the Instron Universal Tester  
stretches equipment dollars simply because it saves money.  
And it saves money — and time — and trouble —  
simply because it *does* more . . . more accurately.  
*For facts booklet, write:*



**INSTRON**  
**ENGINEERING CORPORATION**

446 Hancock Street, Quincy 71, Massachusetts

HAROLD HINDMAN '39 II

GEORGE S. BURR '41 VIII

## **PHYSICISTS, MATHEMATICIANS, ENGINEERS**

are invited to join the Lincoln Laboratory  
scientists and engineers whose ideas have  
contributed to new concepts in the field  
of electronic air defense.

A brochure describing the following Laboratory  
programs will be forwarded upon request.

**HEAVY RADARS**  
**MEMORY DEVICES**  
**TRANSISTORIZED DIGITAL COMPUTERS**  
**SCATTER COMMUNICATIONS**  
**SOLID STATE**  
(air-borne early warning) **AEW**  
(semi-automatic ground environment) **SAGE**  
**SYSTEMS ANALYSIS**

In certain of these programs, positions of  
significant professional scope and responsibility  
are open to men and women with superior qualifications.



**RESEARCH AND DEVELOPMENT**  
**MIT LINCOLN LABORATORY**  
Box 28, Lexington 73, Massachusetts

## **THE TABULAR VIEW**

**Capitalizing on Ability.** — Society — especially a technological one — can best capitalize on the work of men of high talent if its men of ability operate in an environment of creative and intellectually challenging opportunities. Management plays a considerable role in this matter, for aristocrats of mind cannot be successfully directed by proletariats of management. Such, in the main, is the thesis of **FREDERICK HARBISON** whose article in this issue (page 151) was originally delivered before the Twentieth Anniversary Conference of the M.I.T. Industrial Relations Section on November 1. Author Harbison was educated at Princeton University where he received the B.A., M.A., and Ph.D. degrees in 1934, 1938, and 1940, respectively. His research studies have been in the field of the labor problem in economic development in various countries, and he is co-author of *Patterns of Union-Management Relations* and *Goals and Strategy in Collective Bargaining*. Dr. Harbison has been professor of industrial relations and executive officer of the Industrial Relations Center of the University of Chicago. At present, he is professor of industrial relations and director of the Industrial Relations Section at Princeton University. He is a member of the American Economic Association and of the American Academy of Arbitrators.

**Pinnacle of Reliability.** — The problems of designing and installing a transoceanic telephone cable are vastly more difficult than that of producing a satisfactory cable for telegraphy, or even of providing transoceanic radio communication, and required years of research. How this feat was accomplished is told (page 155) by **H. A. AFFEL** who studied electrical engineering at M.I.T. and was graduated with the Class of 1914. After graduation, Mr. Affel spent two years as research assistant in the Department of Electrical Engineering at the Institute before joining the Bell System. From 1916 to 1934 he was a member of the Department of Research and Development of the American Telephone and Telegraph Company, and joined the Bell Telephone Laboratories in 1934. In 1944 he was made director of transmission  
(Concluded on page 138)

Ward Baking Company  
Merkle & Elberth  
Architects



### **New problem for many executives**

If the responsibility for having a new building erected has been placed in your lap, you'll find smoother going by engaging a builder of proven ability and experience.

We offer over 40 years of know-how, gained in giving fast, superior service to over 400 clients. More than 70% of our business is repeat contracts.

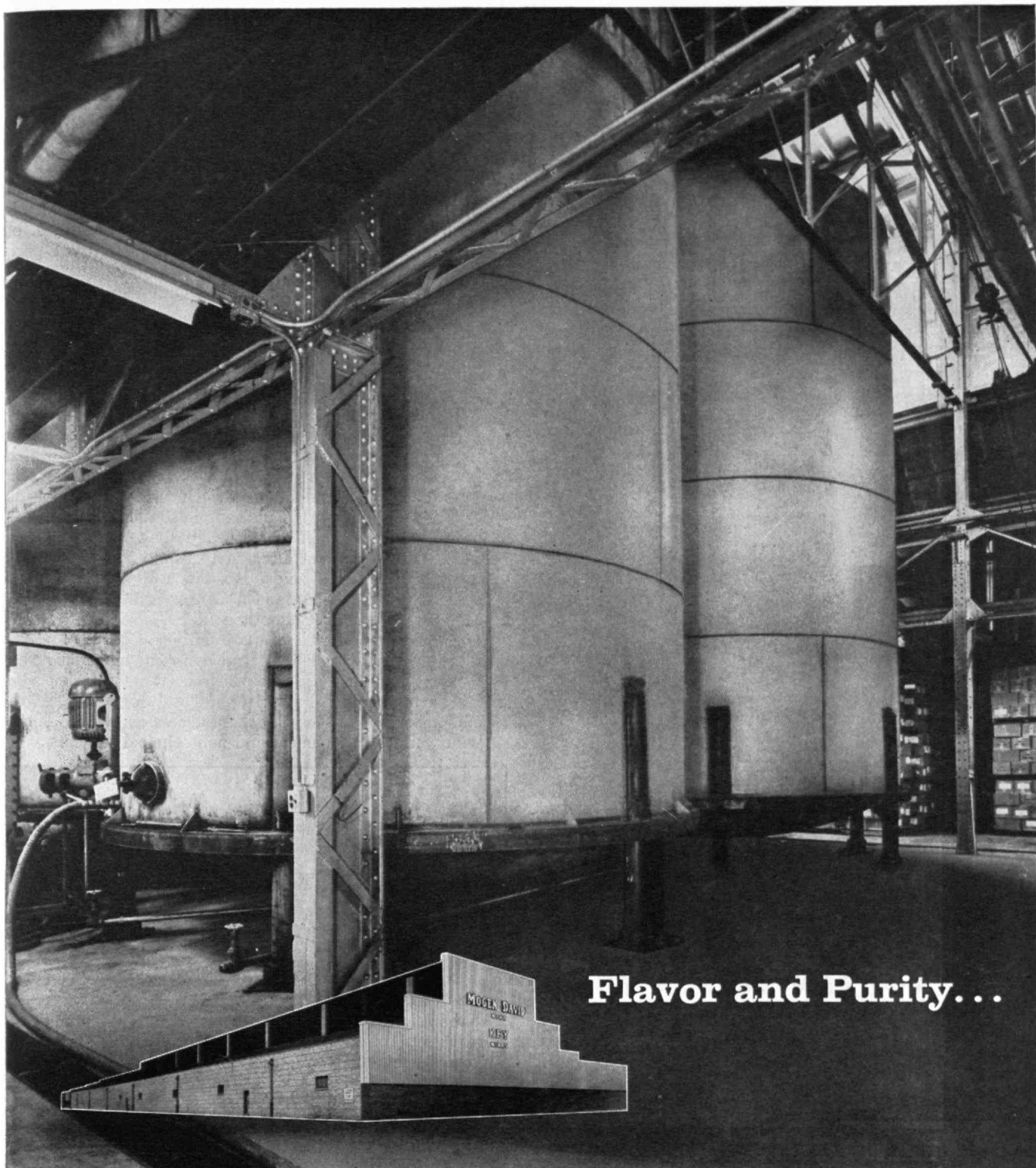
### **W. J. BARNEY CORPORATION**

Founded 1917

**INDUSTRIAL CONSTRUCTION**

101 Park Avenue, New York

Alfred T. Glassett, '20, President



**Flavor and Purity...**

## ASSURED BY 15 SITE-ERECTED STAINLESS TANKS

Half a million gallons of Mogen David Wine Corporation's popular Key wines are blended and stored in 15 stainless tanks site-erected by Graver at Chicago's newest winery. Graver crews erected four tanks, 18'6" diameter x 28'6" high, and eleven tanks, 14' diameter x 18'3" high, all of Type 304 stainless steel. By the selection of stainless steel, the distinctive flavor of 3 entirely different Key Wine brands is maintained consistently during storage and blending. If flavor and purity are factors in your product, be sure to consult with Graver engineers.

ALLOY DIVISION



### GRAVER TANK & MFG. CO., INC.

EAST CHICAGO, INDIANA • NEW YORK • PHILADELPHIA • EDGE MOOR, DELAWARE  
PITTSBURGH • DETROIT • CHICAGO • TULSA • SAND SPRINGS, OKLAHOMA  
HOUSTON • NEW ORLEANS • LOS ANGELES • SAN FRANCISCO • FONTANA, CALIFORNIA





## GEARS

**Made to Your Specifications**

You and we can form a team—you to draw up the specifications; we to make the gears—that will be profitable to both of us. Gears of all types, all sizes, all materials. Design-engineering service available.

**Custom Gears Exclusively**

**DIEFENDORF GEAR CORPORATION**

Syracuse 1, N. Y.

# DIEFENDORF GEARS



## FREE BOOKLET TELLS WHAT CO<sub>2</sub> CAN DO FOR YOU

agriculture  
chemistry  
metals  
electronics  
refrigeration  
food  
drugs  
textiles  
rubber

There's practically no end to the important jobs that CO<sub>2</sub>—combined with Liquid Carbonic savvy—is doing. Chances are this combination can come up with some surprising answers for you, too. For scores of CO<sub>2</sub> applications, covering all industry, send for LIQUID's new free booklet, "Applications Unlimited." Just use the coupon below.

**MAIL THIS COUPON**

**LIQUID CARBONIC**

DIVISION OF GENERAL DYNAMICS CORPORATION

3100 South Kedzie Avenue, Chicago 23, Illinois

Send me my free copy of "Applications Unlimited."

Name \_\_\_\_\_

Company \_\_\_\_\_

Position \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

## THE TABULAR VIEW

(Concluded from page 136)

development, and at present Mr. Affel is assistant vice-president of the Bell Telephone Laboratories, Inc.

**Decaying Era of Mobility.**—A century ago canal routes provided one of the more popular ways of traveling through eastern portions of the United States, or of shipping one's products to market. For the most part, canals have long since given way to more modern modes of transportation, and their contribution to the nation's growth is a chapter of history now seldom opened for review. The era of planning, growth, competition, and final decay of three important canals in the northeastern United States is fetchingly presented (page 159) by FREDERIC W. NORDSIEK, '31, who traversed, on foot, much of the region about which he writes. Mr. Nordsiek is a native New Yorker whose foreign travel brought him to Cambridge for a four-year stint at M.I.T. from which he received his degree in Biology and Public Health in 1931. Since his graduation, Mr. Nordsiek has had wide experience in research and administration in the food industry and in public health activities. From 1943 to 1951 he was assistant director, Research Service Department of Standard Brands, Inc. Since 1951 he has been associated with the American Cancer Society as assistant secretary, Research Committee (1951-1955), and executive officer, Research Department (1955-1957). Currently, Mr. Nordsiek is special assistant, engaged in organizing and administering research grants programs. He has been an editorial associate of *The Review* since 1941, and has achieved considerable success as a writer on a wide variety of technical and nontechnical subjects.

Recent books from The Technology Press

### THE TAO OF SCIENCE

An Essay on Western Knowledge and Eastern Wisdom

by R. G. H. Siu \$4.25

An American scientist with roots in the Orient comments on western philosophy and American educational and business methods.

### SOVIET EDUCATION FOR SCIENCE

AND TECHNOLOGY

by Alexander Korol \$8.50

A timely and authoritative analysis of Soviet education, including a detailed comparison of MIT with Soviet institutions.

Both books are published jointly with John Wiley & Sons

Order from your bookseller



*Apart, they're liquid... together, they're solid*

*...helping make parts for your car,  
your television set, and even your tableware*

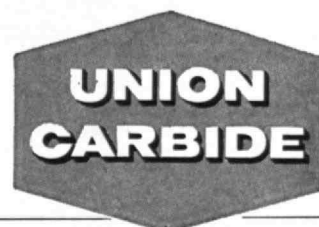
THESE TWO LIQUIDS flow as freely as water. Yet when poured together they quickly turn into a solid—without the use of heat or pressure. Harder than many metals, the resulting plastic is called epoxy.

**Delicate parts for television, radio, and other electronic equipment** are embedded in epoxies to protect them from moisture and vibration. And, in durable tableware, epoxy adhesives seal knife blades in their handles with a strong, permanent bond.

**Epoxies are so hard** that they are used to make the huge dies that stamp out automobile trunk lids and hoods, airplane wing sections and other varied shapes. These dies are molded in about half the time it takes to shape all-metal dies . . . and, at substantial savings.

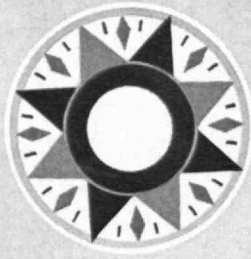
**Many industries** are now looking to epoxies to make better things for you. Developing and producing epoxies—as well as such plastics as vinyl and polyethylene—is only one of the many important jobs of the people of Union Carbide.

**STUDENTS AND STUDENT ADVISERS:** Learn more about career opportunities with Union Carbide in *ALLOYS, CARBONS, CHEMICALS, GASES, and PLASTICS*. Write for "Products and Processes" booklet G-2. Union Carbide Corporation, 30 East 42nd St., New York 17, N. Y. In Canada, Union Carbide Canada Ltd., Toronto.



*UCC's Trade-marked Products include*

BAKELITE, VINYLITE, and KRENE Plastics   PYROFAX Gas   NATIONAL Carbons   UNION Calcium Carbide   UNION CARBIDE Silicones  
SYNTHETIC ORGANIC CHEMICALS   LINDE Oxygen   PRESTONE Anti-Freeze   HAYNES STELLITE Alloys   Dynel Textile Fibers  
CRAG Agricultural Chemicals   PREST-O-LITE Acetylene   EVEREADY Flashlights and Batteries   ELECTROMET Alloys and Metals



# **WILLIAM J. ROUNTREE CO., INC.**

*Established 1916*



Steamship Agents,  
Operators,  
Charterers



**REGULAR FAST FREIGHT SERVICE AROUND THE WORLD**

Main Office: **NEW YORK** 21 West Street Telex N. Y. 2601

**SAN FRANCISCO** 201 Pine Street

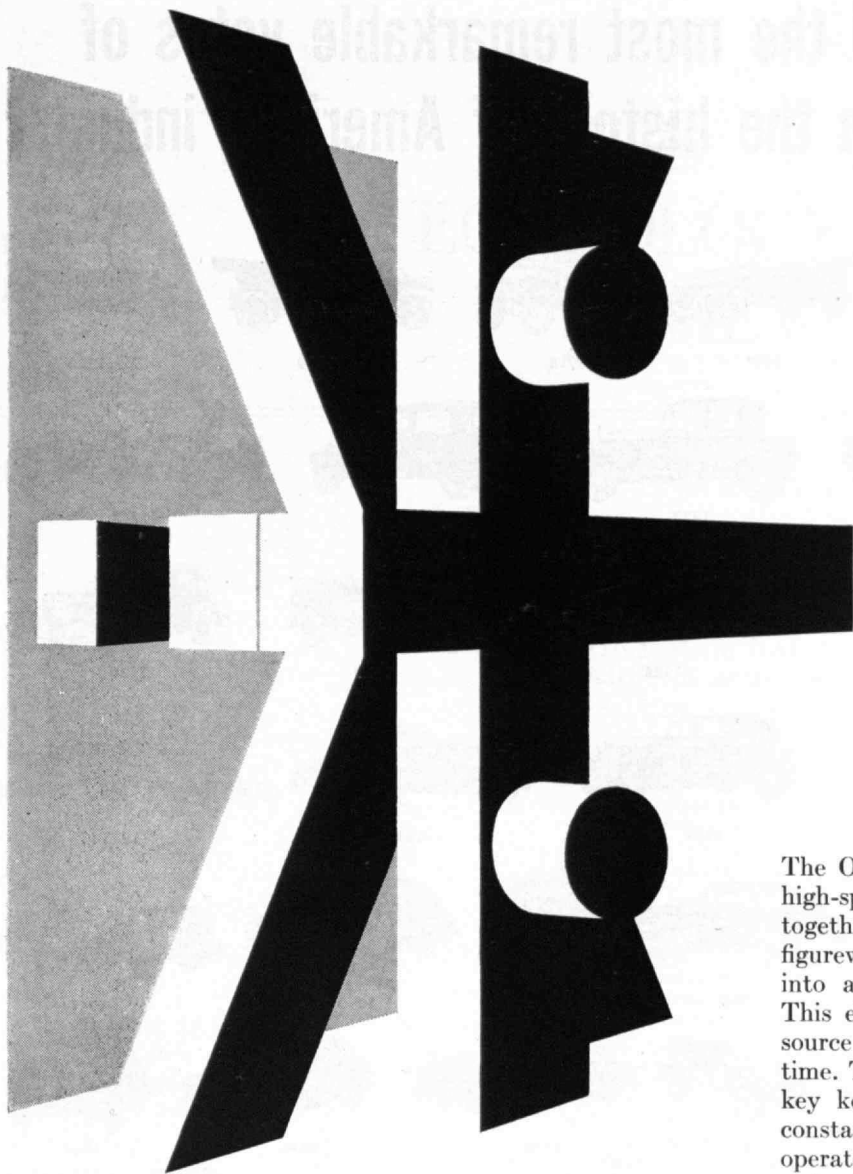
**LOS ANGELES** 609 S. Grand Avenue

**PORTLAND, ORE.** 309 S. W. 6th Street

*Cable Address, All Codes, All Offices "Willtree"*

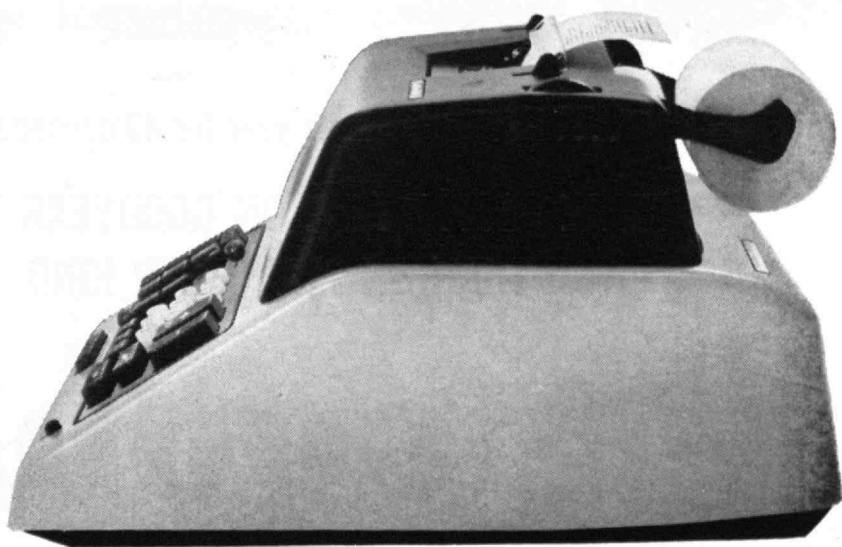
*Lester Wolfe, President '19*





The Olivetti Divisumma 24 is a new high-speed automatic calculator. It fits together the separate parts of a business figurework problem, combining them into a single continuing calculation. This eliminates re-entries, a frequent source of error, and saves considerable time. The machine, with its single 10-key keyboard and unique automatic constant and memory, is quite easy to operate. And, since no business computation is complete until it's on paper, it prints the full record of all calculations. For a demonstration, write Olivetti Corporation of America, 580 Fifth Avenue, New York 36, N. Y.

**olivetti**



# Again . . . one of the most remarkable votes of public confidence in the history of American industry



1915



1916



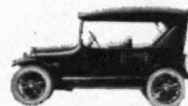
1917



1918



1919



1920



1921



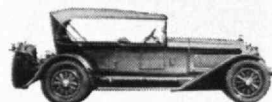
1922



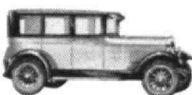
1923



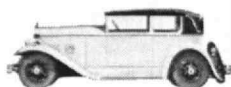
1924



1925



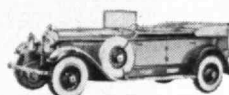
1926



1927



1928



1929



1930



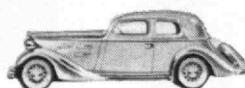
1931



1932



1933



1934



1935



1936



1937



1938



1939



1940



1941



1942



1943



1944



1945



1946



1947



1948



1949



1950



1951



1952



1953



1954



1955



1956



1957

Again in 1958 . . . as in every single year for 43 consecutive years . . .

**MORE PEOPLE RIDE ON GOODYEAR TIRES  
THAN ON ANY OTHER KIND**



**GOOD YEAR**

Watch "Goodyear Theater" on TV—every other Monday, 9:30 P.M., E.S.T.,

# THE TECHNOLOGY REVIEW

TITLE REGISTERED, U. S. PATENT OFFICE

EDITED AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

CONTENTS for JANUARY, 1958,

Vol. 60, No. 3

ANDRÉ MARCHAL AT HOLTkamp ORGAN,  
KRESGE AUDITORIUM

Front Cover

M.I.T. Photographic Service

EDITOR:

B. Dudley

BUSINESS MANAGER:

R. T. Jope

CIRCULATION

MANAGER:

D. P. Severance

EDITORIAL

ASSOCIATES:

Paul Cohen

J. R. Killian, Jr.

F. W. Nordsiek

J. J. Rowlands

EDITORIAL STAFF:

Ruth King

BUSINESS STAFF:

Madeline R. McCormick

PUBLISHER:

H. E. Lobdell

MILLSTONE HILL RADAR EQUIPMENT Frontispiece 144

*Long-range radar equipment, recently developed at Lincoln Laboratory, tracks earth satellites*

UTILIZATION AND DEVELOPMENT  
OF HIGH-TALENT MAN POWER

By Frederick Harbison 151

*The uncommon man wants to work to the limit of his capacity; he thrives on creative and intellectual challenges and opportunities; he requires more able managers than do clerical workers*

DEEP-SEA TRANSOCEANIC CABLE TELEPHONY

By H. A. Affel 155

*The United States is now connected with Europe and the Hawaiian Islands by nonradiating transoceanic telephone cables incorporating electron tubes designed to operate unattended for 20 years*

THE OTHER THREE

By Frederic W. Nordsiek 159

*The Erie and three other canals served New York markets ably during the Nineteenth Century, but gave way to more modern means of transportation*

THE TABULAR VIEW

136

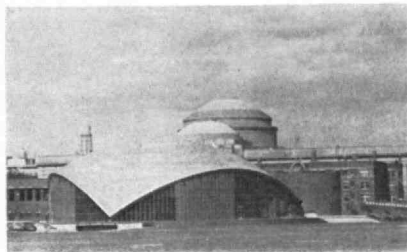
*Contributors and contributions to this issue*

THE TREND OF AFFAIRS

145

*Relating to the Massachusetts Institute of Technology*

Published monthly from November to July inclusive on the twenty-seventh of the month preceding the date of issue, at 60 cents a copy. Annual subscription, \$4.00; Canadian and foreign subscription, \$4.50. Published for the Alumni Association of the M.I.T.; Gilbert M. Roddy, President; H. E. Lobdell, Executive Vice-president; John J. Wilson, D. Reid Weedon, Jr., Vice-presidents; Donald P. Severance, Secretary-Treasurer. Published at Hildreth Press, Inc., Bristol, Conn. Editorial Office, Room 1-281, Massachusetts Institute of Technology, Cambridge 39, Mass. Entered as second-class mail matter at the Post Office at Bristol, Conn. Copyrighted, 1958, by the Alumni Association of the Massachusetts Institute of Technology. Three weeks must be allowed to effect change of address, for which both old and new addresses should be given.



*At the sign of  
the three concrete domes*

*Photograph by  
Oswald Cammann, '20*





M.I.T. Photo

### **Millstone Radar**

*With an 84-foot parabolic antenna atop a 90-foot tower, this new radar equipment is intended for research in problems of ballistic missile defense. One of its first tasks was to observe and compute satellite trajectories, as first announced by J. A. Stratton, '23, Acting President of M.I.T., at the November 18 meeting of the M.I.T. Club of New York.*



## The Trend of Affairs

### New Radar Checks Satellites

■ Very large and high-powered, long-range radar equipment, recently developed at the Lincoln Laboratory of M.I.T., Lexington, Mass., has been detecting the Russian satellites, Sputnik I and II, at remote distances. These detections have been assisted by, and have confirmed the accuracy of, predicted positions calculated from radio observations by Lincoln scientists and engineers.

Since October 5, the day following the launching of Sputnik I, Lincoln scientists have observed by radio the passings of the Russian satellites over the northeastern United States. Starting on the first night with a single radio-receiving equipment at the Laboratory in Lexington, the Lincoln effort was expanded rapidly to include observations from four separate locations. Tape recordings of Sputnik signals have been made on both the 20- and 40-megacycle frequencies. Correlation of data from these multiple sightings has made it possible to pinpoint positions of the satellites with considerable accuracy.

The new radar equipment, located on Millstone Hill, Westford, Mass., first observed Sputnik II on the morning of November 7 at twelve minutes past five. From these observations, measurements of range, elevation, bearing and Doppler frequency were made. At this time the height of the satellite was 152 miles. But Sputnik observation is a "sideline" activity for the Millstone installation.

The Millstone radar was designed for use as a research tool, primarily for the study of problems in ballistic missile defense. It will provide valuable information on the operation and applications of high-power, long-range radar and will be of assistance in securing a better understanding of the radio effects of meteors and the aurora.

Development of the Millstone radar required new tools and techniques in the design of both the radar and its associated equipment. Advances were made in transmitter power, in large antenna and mount mechanics, and in other types of equipment.

The Millstone Hill facility will support co-operation between the U.S. Air Force and the Defense Research Board of Canada in research concerning the ballistic missile defense of North America.

### Report of the Treasurer

■ The major trends and developments in Institute financial affairs for the fiscal year 1956-1957 are summarized below by Joseph J. Snyder, '44, Treasurer:

	1956-57	1955-56	Change
Academic operations	\$ 19,489,000	\$ 17,099,000	+ \$2,390,000
Division of Sponsored Research	49,118,000	43,092,000	+ 6,026,000
Total funds	87,471,000	82,679,000	+ 4,792,000
Plant assets	41,309,000	37,980,000	+ 3,329,000
Gifts and grants	8,498,000	10,387,000	- 1,889,000
Investments — market value	128,086,000	123,683,000	+ 4,403,000
Investments — book value	85,314,000	79,390,000	+ 5,924,000

### Operations

The operations of the Institute in 1956-1957 are set out in the following exhibit:

Revenues and funds	1956-57	1955-56
Tuition and other income	\$ 6,458,000	\$ 4,964,000
Investment income	1,793,000	1,890,000
Gifts and other receipts	4,215,000	3,859,000
Contract allowances for indirect expenses	5,230,000	4,580,000
Auxiliary activities	1,793,000	1,806,000
Total	\$19,489,000	\$17,099,000
Expenses		
Academic	\$ 8,116,000	\$ 6,901,000
General and administration	6,272,000	5,237,000
Plant operations	3,136,000	3,014,000
Auxiliary activities	1,965,000	1,947,000
Total	\$19,489,000	\$17,099,000

For three successive years prior to 1955-1956, academic expenses were in the six-million-dollar range. In 1955-1956 academic expenses approached the seven-million-dollar mark and for the fiscal year 1956-1957, exceeded \$8,000,000. This uptrend reflects the program in recent years to increase Faculty salaries and the compensation of Institute employees. The expense of Faculty and employee benefits has doubled in the last two years. The expense of benefits for all M.I.T. employees, including the Division of Sponsored Research, is in general and administration expenses. Faculty salary expenses in 1956-1957 were

further increased by additional compensation provided for summer session teaching occasioned by the change for the Faculty from ten and one-half months' to nine months' teaching duties, with no reduction in basic annual salary.

### Gifts

The gifts for 1956-1957 are compared to 1955-1956 in this table:

	1956-57	1955-56
Gifts for endowment	\$ 2,381,000	\$ 2,404,000
Gifts for buildings	731,000	1,134,000
Gifts for current use — invested	1,330,000	2,176,000
Industrial Liaison support	1,293,000	1,105,000
Other funds for current use	2,763,000	3,568,000
Total gifts	\$ 8,498,000	\$10,387,000

Substantial additions to endowment in 1956-1957 included bequests from Mary C. Emery, Arthur E. Fowle, Glenn L. Martin, and Henry D. Warren. The second part of the grant from the Ford Foundation for faculty salaries was received during the year. Receipts from the National Science Foundation and the Kresge Foundation made up the greater part of the gifts and grants received for buildings and equipment during the year. Gifts directly to the Alumni Fund of \$356,179 are included in gifts for current use — invested and make up a part of the total of \$641,371 credited by the Alumni Fund Office. Contributions for the Faculty Salary Adjustment Fund are included in gifts for current use — invested in the amount of \$518,000. Funds for staff compensation were also increased by a gift from the Alfred P. Sloan Foundation, Inc., included in other funds for current use.

### Funds

Endowment and other funds increased by \$4,792,000 during 1956-1957:

	1956-57	1955-56
Endowment for general purposes	\$34,902,000	\$33,994,000
Endowment for designated purposes	19,882,000	17,090,000
Total endowment funds	\$54,784,000	\$51,084,000
Other funds	32,687,000	31,595,000
Total funds	\$87,471,000	\$82,679,000

Total endowment resources of \$54,784,000 on June 30, 1957, compare with endowment funds of \$41,248,000 five years ago and \$34,287,000 ten years ago. New endowment resources were added during the year for Faculty salaries, for the support of academic departments, for undergraduate scholarships, and for plant operations.

Increases were recorded in funds for the Faculty Salary Adjustment Program, for academic department purposes, in funds for the funding of Faculty tenure salaries and related expenses now met with other resources, in net realized gains on investment transactions, and in the reserve of unallocated investment income. These increases were offset in part by decreases in building funds and unrestricted funds during the year.

With retirement funds included, the total book value of funds on June 30, 1957, was \$96,378,000.

### Plant Facilities

The Karl Taylor Compton Laboratories, including the Computation Center, and the nuclear reactor accounted for most of the \$3,339,000 payments for construction added to educational plant in 1956-1957. Since the close of the fiscal year, the National Guard Armory on Massachusetts Avenue and Vassar Street was purchased by the Institute from the Commonwealth of Massachusetts, subject to an occupancy agreement of limited duration. The building funds on hand at the close of the year were fully committed but with gifts receivable were sufficient to meet all construction in progress and the cost of the Armory building. Construction of the David Flett du Pont Athletic Center adjoining the Armory will be undertaken during 1957-1958, and this structure will constitute the principal addition to academic plant in 1957-1958.

The book value of the educational plant of the Institute was \$41,309,000 on June 30, 1957, compared to \$37,980,000 on June 30, 1956.

### Investments

The investment position of the Institute on June 30, 1957, and June 30, 1956, is presented in the following table, which is exclusive of the investments of the M.I.T. Pension Association and the Supplementary Retirement Plan.

	June 30, 1957		June 30, 1956	
	Book Value	Market Value	Book Value	Market Value
General Investments				
Bonds	\$42,550,000	\$ 39,957,000	\$38,704,000	\$ 38,183,000
Stocks	22,122,000	64,049,000	22,457,000	63,649,000
Real estate	11,863,000	11,863,000	10,503,000	10,503,000
Commercial paper	2,208,000	2,208,000	1,477,000	1,477,000
Total	\$78,743,000	\$118,077,000	\$73,141,000	\$113,812,000
Special investments				
Student notes receivable	4,791,000	8,229,000	4,765,000	8,387,000
Total	\$85,314,000	\$128,086,000	\$79,390,000	\$123,683,000

Funds sharing in the income from the general investments earned 6.14 per cent on the average book value compared to 6.29 per cent last year. This year 5 per cent plus a special distribution of  $\frac{1}{2}$  of 1 per cent was allocated to the funds, which compares with 5 per cent and 1 per cent, respectively, last year. These special distributions have been made from the reserve of unallocated investment income. The total income on the general and special investments in 1956-1957 was \$4,263,000, compared to \$4,070,000 for the fiscal year 1955-1956.

The proportion of the general investments in bonds at market value was 33.8 per cent on June 30, 1957, and 33.5 per cent on June 30, 1956; but the proportion of investment income from bonds increased from 25.1 per cent to 30.1 per cent. At market values the proportion of the general investments in stocks decreased from 55.5 per cent on June 30, 1956, to 53.7 per cent on June 30, 1957; and the proportion of investment income represented by common stock dividends declined from 62.2 per cent to 57.0 per cent.



The increase in the funds of the Institute of \$4,792,000 in 1956-1957 contrasts with the increase of \$8,846,000 in 1955-1956. This reduced rate of growth was due in part to the receipt in 1954-1955 and 1955-1956 of funds for construction and other purposes to be expended in 1956-1957 and in succeeding years. Construction payments were \$3,339,000 in 1956-1957 and \$1,847,000 in 1955-1956. The growth in endowment funds in 1956-1957 was maintained at the level of the preceding year.

## Gerard Swope: 1872-1957

■ Gerard Swope, '95, former President of the General Electric Company and an Emeritus Life Member of the M.I.T. Corporation, died in New York City on November 20. He was 84 years old.

An industrial leader noted for public service in social, civic, and humanitarian fields, Mr. Swope began his career in 1893 with a dollar-a-day summer job as helper in the General Electric repair shops in Chicago. After receiving his S.B. degree in Electrical Engineering at M.I.T., he began a 20-year climb from shopworker to vice-president and director of Western Electric Company.

International tributes to his World War I service with the War Department included the Distinguished Service Medal, the Medal of Chevalier of the Legion of Honor, and the Order of the Rising Sun.

Mr. Swope returned to the General Electric Company in 1919 as first president of the International General Electric Company, and three years later he was elected president of General Electric. Under his direction from 1922 to 1939, G.E. mass production expanded from incandescent electric lamps to a wide range of electric appliances for home use. Mr. Swope, also closely identified with the development of radio and radio accessories, was a director of 18 companies in the electric and power industry. After his retirement in 1939, he served as chairman of the New York City Housing Authority and, during World War II, resumed the presidency of the General Electric Company for two years.

In addition to his contributions in the fields of business, science, and engineering, he headed numerous organizations working for improved housing, industrial stabilization, unemployment insurance, and so on. For his public service he received the gold medal of the National Academy of Social Sciences in 1932 and the Hoover Medal in 1942. Mr. Swope was awarded honorary degrees by Union College; Rutgers, Colgate, and Washington Universities; Stevens Institute of Technology; and Technion-Israel Institute of Technology, Haifa. He served as term member of the M.I.T. Corporation from 1914 to 1919 and was elected to life membership in 1923.

Mr. Swope conceived of the Technology Loan Fund as a means of aiding students of limited financial means to borrow money to pay tuition expenses. The Fund, which Mr. Swope collected — and to which he was a substantial contributor — became operative in September, 1930, and has since proven to be a most effective method of encouraging deserving M.I.T. students to invest in their own self-development.

## On the Horizon

**February 4, 1958** — Midwinter Meeting of Alumni Association, M.I.T. Campus in Cambridge.

**March 1, 1958** — 12th M.I.T. Alumni Regional Conference, Washington, D.C. (For further information, consult T. K. Meloy, '17, 3000 Arlington Boulevard, Falls Church, Va.)

**March 13-15, 1958** — 10th Annual Fiesta, M.I.T. Club of Mexico, Mexico City, D.F. (For reservations, consult Clarence M. Cornish, '24, Margaritas 139, Villa Obregon, Mexico 20, D.F., Mexico.)

**June 16, 1958** — 24th Alumni Day, 1958, M.I.T. Campus in Cambridge.

## Repeat Performance

■ According to figures compiled here at the Institute, a grand total of 6,179 students (which includes 2,515 graduate students) is registered this fall, and of these, 909 are members of the Freshman Class.

A repeat performance is being staged by 29 of these freshmen, who have decided upon M.I.T. as the school of their choice, and who bear the same family names as M.I.T. Alumni. They are listed below.

With more and more emphasis being placed upon the need for sound engineering and scientific training, the old adage "like father, like son" might be hoped for by everyone.

<i>Student</i>	<i>Parent</i>
William J. Barrett	William J. Barrett, '16
John S. Cramton	Frank N. Cramton, '26
William W. Farr	William W. Farr, '26
Alden T. Foster	F. LeRoy Foster, '25
Freeman W. Fraim	Freeman W. Fraim, Jr., '32
Christopher T. Frank	Nathaniel H. Frank, '23
Reed H. Freeman	Reed Freeman, '38
Hugh P. Gilman	Donald B. Gilman, '32
Robert W. Goldthwaite	Clarence H. Goldthwaite, Jr., '35
Joseph Harrington, 3d	Joseph Harrington, Jr., '30
<i>Grandfather: Joseph Harrington, '96</i>	
Thomas N. Hastings	Russell Hastings, Jr., '34
<i>Grandfather: Russell Hastings, Sr., '10</i>	
Peter M. Kraus	Fred M. Kraus, '35
Frank M. Labouisse, Jr.	Frank M. Labouisse, '33
David H. LaForge	Louis H. LaForge, Jr., '37
David W. Latham	Allen Latham, Jr., '30
Robert W. Lewis	Frederick B. Lewis, '28
Richard L. Meehan	William Meehan, '26
Joseph H. Melhado, Jr.	Joseph H. Melhado, '27
Eric A. Moorehead	Eric O. Moorehead, '37
<i>Grandfather: Theodore P. Moorehead, '05</i>	
Richard E. Peterson	Carl M. F. Peterson, '29
James W. Poitras	Edward J. Poitras, '29
Charles W. Rogers	Robert C. Rogers, '33
Edgar C. Rust, 3d	Edgar C. Rust, Jr., '37
Marshall R. Sack	Melvin Sack, '28
Kenneth R. Scott	Arthur K. Scott, '29
Alan J. Stratton	Carl P. Stratton, '34
<i>(Deceased)</i>	
Peter Ver Planck	Dennistoun W. Ver Planck, '28
Carl E. Wagner	Lawrence F. Wagner, '32
Warren C. Wetmore	Joseph W. Wetmore, '31



Dick Preston

During the celebration (June 7-10) of the 55th reunion of the Class of 1902, these 16 guests were photographed aboard a seaworthy motor launch in the bay, adjacent to Wentworth-by-the-Sea at Portsmouth, N.H., where the reunion was held. Reading from left to right, are: Burton G. Philbrick, Charles W. Kellogg, Mrs. Everett, Harold A. Everett, Arthur L. Collier, Mrs. Allen, Carlton B. Allen, Mrs. Marvin, J. Albert Robinson, Edwin E. Nelson, John R. Marvin, Mrs. Collier, Lewis E. Moore, Russell B. Lowe, Claude E. "Dan" Patch, and Alfred W. Friend (whose death on August 4 was noted with sorrow). Not seen in the picture above, but present at the reunion, were: Mr. and Mrs. William R. Greeley, and Norman E. Borden.

## Individuals Noteworthy

■ Prominent in the news of late autumn were 38 promotions, elections, or appointments as set forth below:

Clarence D. Howe, '07, as a Director, Canadian Fund, Inc. . . . Lyle M. Richardson, '14, as President, Morton C. Tuttle Company . . . Craig P. Hazelet, '18, and Philip C. Rutledge, '33, as Directors, American Society of Civil Engineers . . .

Albert E. Bachmann, '21, as President, American Pulp and Paper Mill Superintendents Association . . . Edwin T. Steffan, '21, as President, Boston Society of Architects . . . Arthur W. Davenport, '23, as Project Manager in Brazil, Stone and Webster Engineering Corporation . . .

Hugh S. Ferguson, '23, as a Director, National Research Corporation . . . Rodolphus K. Turner, '23, and Roland D. Glenn, '33, respectively, as President and Vice-president—Development, Bakelite Company . . . Philip D. Blanchard, '24, as Vice-president, Wyatt, Inc., New Haven, Conn. . . .

Hartselle D. Kinsey, '24, as President, Union Carbide Olefins Company . . . Denton Massey, '24, as Vice-president and Director, AMF Atomics (Canada), Ltd. . . . Charles H. Wardwell, '24, as President, Continental Screw Company . . .

Clarence J. LeBel, '26, as Secretary, Audio Engineering Society . . . George S. Mikhalapov, '26, as Executive Vice-president, Brush Beryllium Company . . . Harold W. Fisher, '27, as Joint Managing Director, Iraq Petroleum Company, Ltd. . . .

Maurice C. Beren, '28, as President, Pyrotex Leather Company, Leominster, Mass. . . . Solomon Horwitz, '29, as a Director, American Institute of Steel Construction . . . E. Ralph Rowzee, '30, as

President and Managing Director, Polymer Corporation, Ltd. . . .

Gordon S. Brown, '31, and Donald G. Fink, '33, respectively, as a Director and as President, Institute of Radio Engineers . . . Stuart R. Fleming, '32, as Vice-president of Ford, Bacon, and Davis . . . John Lawrence, '32, as Vice-president, Dresser Industries, Inc. . . .

Joseph L. Bird, '33, as Vice-president, Dynaform Corporation . . . Norman E. Harris, '33, as Vice-president and Sales Manager, Standard Plastics Company, Inc. . . .

Samuel A. Groves, '34, as a Director, Boston Manufacturers Mutual and Mutual Boiler and Machinery Insurance Companies . . . John Sullivan, Jr., '38, as President, Dayton Art Institute . . . John R. Brown, Jr., '39, as Vice-president, Colgate-Palmolive Company . . . William R. Ahrendt, '41, as Chairman and Treasurer, Integron, Waltham, Mass. . . .

James G. Buck, '42, as Director of Research and Development, Erie (Pa.) Resistor Corporation . . . Stanley N. Golembe, '42, as Executive Vice-president, Power Sources, Inc. . . .

Robert Oppenlander, Jr., '44, as a Principal of Cresap, McCormick, and Paget . . . Jephtha H. Wade, '45, as a Member of the Corporation, Museum of Science, Boston . . . Philip R. Marsilius, '48, as President, National Tool and Die Manufacturers Association . . .

John F. Matthews, '48, as Executive Vice-president, Forstmann Woolen Company . . . Beverley J. Kirkwood, '49, as a Partner of A. C. Kirkwood and Associates, Kansas City . . . Donald G. O'Brien, '51, as Chairman and President, American Measurement and Control, Inc., Waltham, Mass.

■ Special honors coming recently to Alumni and members of the Institute Faculty included:

To *Horace A. Crary*, '94, the Benjamin Rush Award to a layman for public health services, by the Pennsylvania Medical Society . . . to *Howard S. Morse*, '03, and *Whitney C. Huntington*, '23, honorary membership, by the American Society of Civil Engineers . . . to *Warren K. Lewis*, '05, its Gold Medal for distinguished achievement, by the American Petroleum Institute . . .

To *Irving W. Wilson*, '11, *Donald W. Douglas*, '14, and *Crawford H. Greenewalt*, '22, three of the "Fifty Foremost Business Leadership Medals" awarded by *Forbes Magazine* upon the occasion of its 40th Anniversary. As if further to emphasize Technology Alumni business leadership, Mr. Douglas was among the 50 similarly designated on the magazine's 30th anniversary; and the original list of 50, chosen by the late B. C. Forbes himself in the first issue published in 1917, included the late *Coleman du Pont*, '84 . . .

To *Vannevar Bush*, '16, the annual New England Award, by the Engineering Societies of New England . . . to *Roderick K. Eskew*, '21, the Superior Service Award, by the U.S. Department of Agriculture . . . to *Arthur E. Raymond*, '21, the 1957 Daniel Guggenheim Medal, by the Institute of the Aeronautical Sciences . . . to *Hermon F. Safford*, '23, named as National Management Man for 1957, by the National Management Association . . .

To *John M. Campbell*, '25, the Harry L. Horning Award, by the Society of Automotive Engineers . . . to *Vladimir Haensel*, '37, the 1957 Professional Progress Award in Chemical Engineering, by the American Institute of Chemical Engineers . . .

To *Frank A. McClintock*, '42, the 1957 James Clayton Fund Prize, by the Institution of Mechanical Engineers, London . . . to *Glenn W. Stagg*, '48, selection as one of the nation's three outstanding young electrical engineers, by Eta Kappa Nu . . .

To *John Chipman*, Professor of Metallurgy, its Gold Medal and Senior Award, by the American Society for Metals.

■ Among the Alumni to whom birthday congratulations are appropriate during this month are two who are due to celebrate their 85th and six who will observe their 80th anniversaries, as listed below with their respective dates of birth:

January, 1873 — *Louis A. Freedman*, '96, on the 1st; and *Raymond M. Hughes*, '98, on the 14th.

January, 1878 — *Frank DeM. Gage*, '00, on the 14th; *Arthur W. Geiger*, '00, on the 14th; *Avery Robinson*, '99, on the 21st; *Warren W. Sanders*, '00, on the 22d; *Walter H. Sutliff*, '99, on the 23d; and *Roy G. Burnham*, '00, on the 29th.

With these eight, the rolls of the Alumni Association will include a total of 56 living nonagenarians and 577 octogenarians.

## Silver Stein Dinner

■ The M.I.T. Club of New York held its fifth annual Silver Stein Award Dinner at the Hotel Biltmore on November 18, during which presentation of the much valued Silver Stein was made to *C. George Dandrow*, '22. The award, made to Mr. Dandrow for his valued contributions and services to Technology alumni affairs generally, and for his efforts in behalf of the M.I.T. Club of New York in particular, was the silver stein which Mr. Dandrow holds as shown in the illustration on this page.

*Alfred T. Glassett*, '20, lifelong friend of Mr. Dandrow, quite fittingly made the introductory remarks prior to the presentation. Basically, Mr. Glassett used the "This Is Your Life" approach, tracing Mr. Dandrow's career from the time both entered high school, through their years together at the Institute, and up to the present. Mr. Dandrow is vice-president for customer relations of the Johns-Manville Sales Corporation. He has been an active participant in Alumni Association affairs, serving as President of the Association in 1948-1949, and is a former president of the M.I.T. Club of New York.

Although *James R. Killian, Jr.*, '26, President of M.I.T., originally had been scheduled to take part in the Silver Stein Award Dinner, his preoccupation with national defense matters in Washington, D.C., prevented him from attending. *J. A. Stratton*, '23, Acting President, was in attendance to bring greetings from the Institute. In his remarks, Dr. Stratton made the first public announcement of new radar facilities, developed at M.I.T.'s Lincoln Laboratory,



*F. S. Lincoln*, '22

Attending the Award Dinner in New York, when the silver stein was presented to Mr. Dandrow, were (left to right): *H. E. Lobdell*, '17, Executive Vice-president of the Alumni Association; *J. A. Stratton*, '23, Acting President and Chancellor of the Institute who brought greetings from M.I.T. to the guests at the dinner honoring Mr. Dandrow; *C. George Dandrow*, '22, Vice-president for Customer Relations of the Johns-Manville Sales Corporation; *Alfred T. Glassett*, '20, presenting the silver stein to Mr. Dandrow; *Thomas C. Desmond*, '09, New York State Senator and a previous recipient of the silver stein; and *Eugene R. Smoley*, '19, President of the M.I.T. Club of New York.





*F. S. Lincoln, '22*

*Among the guests at the Silver Stein Dinner on November 18 were (left to right): Mrs. Miller and Theodore T. Miller, '22, Parke D. Appel, '22, and Mrs. F. S. Lincoln.*

which were used to track the path of one of the earth's satellites. A photograph of the new radar antenna appears as the frontispiece of this issue, and a brief description appears on page 145.

When concluding his warm and heartfelt response to the tribute tendered him, and speaking of the growth of M.I.T. since 1916 when he was a freshman, Mr. Dandrow reminded his audience that "It is not easy to grow big effectively and gracefully," but stated that "M.I.T. has done just that."

## Twenty-five Years Ago This Month . . .

■ With the advent of the new year of 1933, an even dozen Alumni were either retiring from or assuming the Presidencies of the following societies:

*Sanford E. Thompson, '88, of the Taylor Society; Charles N. Fitts, '91, of the American Institute of*

*Steel Construction; Alonzo J. Hammond, '91, of the American Society of Civil Engineers;*

*Frank P. McKibben, '94, of the American Welding Society; Bradley Stoughton, '96, of the American Electrochemical Society; Arthur B. Lamb, '02, of the American Chemical Society;*

*Andrey A. Potter, '03, of the American Society of Mechanical Engineers; Harry P. Charlesworth, '05, of the American Institute of Civil Engineers; James I. Banash, '06, of the National Safety Council;*

*Roy A. Seaton, '11, of the Society for the Promotion of Engineering Education; John A. Allan, '12, of the Canadian Mining Institute; and Joseph W. Barker, '16, of the Illuminating Engineering Society.*

■ The Compton Cup, "appropriately named for Dr. Karl Taylor Compton as an honorary alumnus of Harvard University, former Head of the Physics Department of Princeton University, and President of Technology, was given by the student body of Technology to perpetuate an annual crew race between the three schools." This handsome trophy of English sterling silver, made in 1840 and obtained from the Rodman Wanamaker collection, stands 18 inches high and weighs 112 ounces.

■ Congratulations were being extended to *Charles H. Woodbury, '86, for winning the Edwin Palmer Memorial Prize of \$1,000 awarded by the National Academy of Design; . . . to George E. Hale, '90, as the recipient of the Copley Medal of the Royal Society, which honor had previously come to Benjamin Franklin for his "curious experiments and observations on electricity"; . . . and to W. Spencer Hutchinson, '92, Head of the Institute's Department of Mining Engineering, for his prediction at the annual meeting of the American Institute of Mining and Metallurgical Engineers that the use of oil and gas for energy production in the United States would double during the ensuing 20 years.*



*The color analyzer developed during 1932-1933 by Professor Arthur C. Hardy, '18, designed primarily to measure the color of opaque materials, such as paper, textile fabrics, ceramic products, and surfaces coated with paint, ink, or lacquer. Left to right: Vannevar Bush, '16, Vice-president and Dean of Engineering; Professor Hardy; President Karl T. Compton; Samuel C. Prescott, '94, Dean of Science; and Harry M. Goodwin, '90, Dean of the Graduate School.*

*M.I.T. Photo*

# Utilization and Development of High-Talent Man Power

**Management is urged to become more sophisticated, to recognize individual ability, and to provide creative and intellectual opportunity for professional talent**

**by FREDERICK HARBISON**

**I**N the perspective of world history, our age may become known as the Century of Science. Within the last 50 years, man has learned to fly, to communicate globally by radio, telephone, and television, and to perform more than 10,000 complicated multiplications per second on an electronic computing machine. At mid-century there were developed in rapid succession nuclear energy, the intercontinental ballistic missile, and the earth satellite. And, in the foreseeable future, we may control the weather on this planet and start regularly scheduled flights to the moon. In a recent speech at the University of California, Professor Edward Teller pointed out that our scientific knowledge has doubled every 100 years since 1650. In other words, in each 100-year period since that time, we have learned more than in all previous times put together. Today we know twice as much as we did in 1850, but only half as much as we shall know in 2050.

This cumulative acceleration of knowledge is reflected in the changing occupational structure of the labor force. For example, between 1870 and 1950, the number of professional workers in the United States has grown three and one-half times faster than the nation's population, and three times faster than the labor force generally. If Teller's observations are correct, the proportion of highly trained people is bound to increase even more sharply in the future. Indeed, the application of new scientific principles, quite apart from their discovery, will require droves of scientists, engineers, and administrators of technical man power. Thus it is becoming clear that the central man-power problem of our time is that of generating and accumulating high-talent brain power. As a nation, we are engaged in a great and, in our history, unprecedented hunt for high talent.

In industry, the procurement of professional and scientific man power has become a highly competitive and expensive business. It has been estimated, for example, that the cost of hiring a young engineer and training him to a point of initial productiveness is probably in excess of \$5,000. Company recruiters now swarm to our university campuses like locusts to devour our engineering graduates. And, even more important, companies are looking for high-quality people. They want the cream, not just the skimmed milk. The young man who boasts that he

was graduated in the "upper 90 per cent" of his class does not interest today's talent-hungry recruiters. They are looking — not for the average man — but for the uncommon man. Never before in the history of America have so many people spent so much money and so much effort in the competitive search for men of high talent.

## **More Brain, Less Brawn**

It is obvious that the trend in modern industry is to consume more and more brains and less and less brawn. Let me illustrate this trend by some examples taken from a survey of man-power utilization which we are making at Princeton.

The first is the case of a well-known chemical company. During the postwar period — 1946-1956 — this company expanded its output and sales by 75 per cent. Largely as a result of new processes and machinery, it was able in the same period to reduce its total employment by 10 per cent, and its manual work force by 17 per cent. However, it found it necessary to increase its technical, professional, and administrative staff by 20 per cent.

Next, let us take a steel company whose experience is fairly typical. Here we found that in the postwar period the employment of technical personnel increased over 125 per cent in comparison with an increase of less than 40 per cent in total employment. It showed a similar proportional increase in its managerial and administrative staff. When you look more closely at individual departments, the story is the same. For example, in one case the output per turn in the galvanizing department was increased nearly four times by introduction of continuous galvanizing lines. The total personnel required remained unchanged, but the supervisory and technical staff was increased by about 40 per cent, whereas the number of production workers declined by about 15 per cent.

On the basis of such studies in 30 companies in many different industries, we are coming to these tentative conclusions:

First, all kinds of technological change — including those popularly referred to as automation — increase the proportionate requirements for high-talent personnel — that is, for scientists, mathematicians, engineers, chemists, administrative staff specialists, and high-level managers. Automation may eliminate

unskilled and skilled manual labor, clerical employees, and certain types of routine supervision. It does so, however, by substituting both machinery and higher level human resources. Automation, in other words, always increases the requirements for brain power. The introduction of automatic computing machinery is a case in point. It eliminates labor in data processing; it also enables top management to have very quickly new kinds of information which it was unable to get before; but it usually leads to establishment of planning departments to program the data for processing and to make expert interpretations for top-level decision-making. This requires the employment of very high-level brain power. Obviously, then, the principal human consequence of automation is not the displacement of people but rather the tremendously increased quantity of high-talent man power which it consumes.

Our second tentative conclusion is that change and innovation of all kinds require heavy investment in high-level human resources. Wherever innovations are made—in new products, new processes, new techniques of control, new methods of marketing, or new ideas in management—there is a need for highly trained technical man power and for specialized administrative staff personnel.

From this we derive a third tentative conclusion: the more progressive and dynamic the firm or industry, the greater is its rate of increase of utilization of high-talent man power. For example, in the chemical, aircraft, and electrical industries we find the sharpest increases in utilization of top professional and technical personnel; railroads and shoe factories, on the other hand, show very little increase in proportionate utilization of high-level human resources except in a few departments where new methods and new techniques are being introduced.

On the basis of these three conclusions, we can draw this inference: Dynamic economic development involves a shift in man-power requirements away from manual and clerical operations and toward greater utilization of highly educated man power. Highly educated man power is in short supply, and there is no reason to believe that the demand for it will be satisfied in the next few decades. Therefore, the limiting factor on economic growth in the United States will probably be its capacity to generate high-level human resources rather than its ability to accumulate capital.

#### **Dealing with the Uncommon Man**

If industry faces the prospect of ever-sharpening shortages of high-talent man power, what measures can it take to protect itself? Among the more obvious are the following: (1) substitution of other human resources for highly trained professional personnel wherever possible; (2) use of incentives appropriate for development of the highest possible potential of the professional staff; and (3) development of more sophisticated management. Let us examine each of these very briefly:

Most companies now recognize that trained technical man power should be employed at its highest skill. An engineer should not be performing tasks of craftsmen, nor should he be burdened with routine

clerical operations. Technical assistants can and should be employed to assist highly trained chemists and metallurgists. Likewise the productivity of high-talent man power may be increased by providing it with more secretarial and clerical help. I am sure that all of you know how to break down technical jobs in such a way as to separate out the less skilled tasks, and thus we need not discuss further this very obvious means of substituting less skilled personnel for the highly trained professional employee.

A more complicated problem is the utilization of professional personnel in supervisory and managerial capacities. Some people have suggested that, since good engineers, chemists, metallurgists, and scientists are so scarce, they should be employed only on professional work and that supervisory and managerial responsibilities should be assigned to others. In my judgment, this is a dangerous idea. As we all know, good supervisors and competent managers are usually even harder to come by than good professional people. Thus if the professional employee has those precious skills in human relations which qualify him to integrate and direct the work of others, he should be utilized in a managerial or executive capacity.

A much more critical problem is that first-rate engineers or scientists often turn out to be very poor and unhappy administrators, and a common costly mistake is to reward a professionally outstanding man by "promoting" him to a supervisory job for which he is not qualified. In this connection, the status system in American industry is peculiarly geared to making mistakes of this nature.

In most companies, pay, status, and recognition are much higher for managers and executives than for those engaged in strictly professional work. Thus, the engineer or scientist who would really prefer professional to supervisory work is under heavy social, psychological and financial pressure to conform to the notion that success is tied up with being a big manager or a high executive. Furthermore, if the man does not always feel this way, his wife and his friends are likely to equate executive positions with success. As a consequence, probably two out of three engineers or scientists who enter industry have, as their goal, the eventual entry into the executive or managerial hierarchy, but as nearly as I can determine, only one out of three is needed in this capacity. This can have serious implications. If the fellow does not get a managerial job, he may be dissatisfied, emotionally unadjusted, and quite unproductive. If he gets a managerial position for which he is not qualified, he may be even more disturbed, and his professional talents meanwhile are being wasted.

For this reason, some of the really smart companies today are taking measures to see that the pay, recognition, and status of top-level professional work is equal to that of even very high executive positions, including the floor space of offices, the thickness of carpets, the exposure of windows, and admittance to the executive dining rooms. Some companies refer to this as the parallel ladder system of advancement. In one or two companies I visited recently, it was apparent that, up to the pay levels of about \$15,000



per year, there was fairly parallel treatment of the technically trained person employed in professional work and the technically trained person in supervisory work. However, the parallel ladder idea seems to break down at the very high salary levels. There are instances, of course, of highly paid vice-presidents or super-consultants who are strictly idea-men rather than managers, but these fellows are conspicuous because of their rarity. As a general rule, the professionals in industry do not enjoy the status in comparison with their associates that the professionals in universities command. If they did, the universities probably could not keep their key professors at the levels of pay they are now receiving! In all seriousness, however, I would say that many people with whom I talked in industrial research laboratories indicated that the question of the pay and status of the creative genius in comparison with managers or executives, is one of the thorniest, unsolved problems facing industry today. Here perhaps, industry might pick up some practical ideas by studying organization and administration of universities.

This brings us to the question of motivation of professional and technical employees. In this area, some companies have resorted too often to superficial clichés such as “treating everybody fairly as a human being” rather than to objective analysis of the factors involved. Above all, it is important to remember that in many respects, professional people are quite different from manual labor or clerical employees.

Of course, the matter of pay is as important for technical personnel as for anyone else. An adequate salary, or a fair wage, is simple enough to define for any individual: “At any time or in any society all of us might agree that it is approximately 25 per cent more than we are currently receiving and at least equal to the pay received by those other people who really aren’t doing anything more important than we are.” Most professional employees feel that they are underpaid in comparison with those in supervisory positions. It would appear, therefore, that a sound salary administration program might have as one of its objectives a plausible and convincing explanation to all concerned of the reasons, where they do exist, why supervisory and managerial personnel are more valuable to a company than persons employed in a professional capacity. My impression is that the question of salary for the professional employee, who is utilized in a non-managerial capacity, is often based more upon expedients than upon any really penetrating and objective analysis of the responsibilities involved and the state of the market.

Another important factor is recognition of the professional ambitions of the technical employee. The technically trained man is usually quite sensitive about what is “good” or “bad” from a professional standpoint. He prefers to work for a person who will recognize and respect his professional status. Furthermore, he wants to work for someone who can help him learn and develop professionally. The professional employee wants to perform tasks which will enable him to gain experience and insight in his profession. He wants recognition for his ideas; and he develops an interest in what is going on in other

parts of the organization. In short, professional opportunity and being “in the know” are usually more important to the technical employee than the pay he receives.

Also, good professional people like to be loaded with work, if the work is challenging and if it offers opportunities for creative thinking. There is nothing so damaging to the morale of an engineer or a scientist than having too little to do. In this respect, there may be an important difference between professionals and other employees. Certainly, all evidence points to the fact that the morale of overworked professional employees is higher than those who are utilized below their capacity, and it is probably easier for top management to handle complaints arising out of assignment of too much responsibility than out of failure to assign sufficiently challenging tasks. The professionally trained man seeks above all else intellectual and creative opportunity. He develops a sense of fatherly interest in his ideas and suggestions, and he wants to see how they are being applied, or why they were rejected or pigeonholed. He prefers to work for an intelligent boss—or at least one from whom he can learn. He resents the superior who seeks to assert proprietorship over his suggestions or ideas and who tries to monopolize the channels of communication either with the company’s top brass or the outside professional world.

The third and most critical problem in effectively utilizing and developing technical man power is sophisticated management. If industry is going to employ larger proportions of high-level professional people in the future, it is going to need smarter managers to supervise them. The effective co-ordination of brains calls for much more skill and education than the direction of brawn. You are all aware of the problems of supervising *prima donnas*. Furthermore, brainy people—particularly those who are bursting with new ideas—are sometimes uncomfortable and troublesome fellows to deal with. It is much easier to control the conformist than the idea-man. Most managers feel more secure if there are not too many of these intellectually restless people underneath them. The manager, after all, has some interest in the status quo, whereas the idea-man is continually trying to upset the apple cart.

What is the job description of a good manager of brainy people? Here is one I picked up in conversation a few weeks ago.

The supervisor of professionally trained personnel, even though he may have technical training superior to his subordinates, must be a stimulator and integrator rather than the initiator and developer of ideas. His job is to generate the environment in which *the ideas of others can grow*. He is not the proprietor of the shop, nor is he the kind of guy who gives the orders. He is a chairman, but not a boss of his unit. And while encouraging all sorts of individual initiative and listening at times to all sorts of crazy ideas, he must find some way, for God’s sake, to keep the boys on the reservation!

It is impossible to think of a program of effective recruitment and development of technical man power without considering first the more fundamental problem of how to develop the kind of managers who are equal to this very difficult task.

The problems, then, are fairly easy to define. Since high-talent man power is now very scarce and likely to be even scarcer in the future, companies must find a way to effectively utilize those engineering and scientific brains which they will be able to secure and retain. This involves the substitution of less-skilled human resources for technical brains wherever possible, the development of the professional employee to his highest possible capacity, recognition of the factors which motivate professionally trained people, and more intelligent and sophisticated management.

### Differentiate to Motivate

We have discussed some of the problems involved in the efficient development and utilization of high-level man power; let us turn now to measures for solving these problems. Here we can start by simply making a check list of policies and practices which one finds in the most progressive and advanced companies.

The major concern of progressive companies is the formulation of a program for *effective utilization of existing technical man power*. This must be clearly developed as a prerequisite for any workable strategy of recruitment and placement. Indeed, the recruiting of people without a sound program for utilizing them is like pouring 100-proof whiskey into those paper cups which are supplied on Pullman cars! It will not be long before it all oozes out! The elements in a good utilization program are enumerated in the following seven paragraphs:

1. A study of probable requirements for the future — perhaps for the next five or 10 years. Here, one must be careful to estimate the changing quantitative proportions in requirements for high-level technical personnel. Most companies seem to assume that in the next five to 10 years the structure of their man-power requirements will remain unchanged. But, if the history of past decades is any guide, this assumption is nearly always wrong. It is also important to assess the changing qualitative requirements for scientific and engineering personnel. In other words, will you need tomorrow the same kind of genius which you are trying to find today? This, of course, is a more difficult question, requiring more judgment than statistics.

2. An analysis of the kind of management necessary to supervise technical personnel, and the formulation of a program for training the required managers. In effect, this is just one facet of the broader problem of general management development. Companies which have good manager-development programs usually are on top of this one.

3. Development of a sound and objective plan for determining the pay, status, avenues of advancement, and criteria of promotion of technical personnel, taking into account specifically the question of whether or not certain professional jobs should be rated higher or lower than managerial jobs. In most cases, this requires an agonizing reappraisal of certain assumptions underlying traditional salary classification systems. Very few companies have really faced this problem, but many because of mounting pressure, are on the brink of doing so.

4. A rigorous system of determining just where technical and professional man power is critically needed and why other resources cannot be substituted for it. This usually involves scrutiny of stated departmental requirements by both plant or division managers and central office personnel. Most companies find this easier to say than to do. Some encounter resistance in providing the necessary stenographic and junior technical assistance which fully utilized professional man power may require.

5. The development of an inventory of challenging tasks and opportunities for scientific and engineering man power. This is the kind of thing which makes a company or an industry glamorous in attracting new blood. The aircraft and electronics industries appear to excel here.

6. Provision of appropriate training and self-improvement opportunities for persons who wish to go upward in their respective professions. Most progressive companies today are quite liberal on this score, both in paying direct costs of advanced education and in providing compensated time.

7. Development of a system of communication between the technical staff and management, giving particular attention to the special factors which motivate the professionally trained individual.

Most companies agree that these steps are desirable. However, very few companies do these things until the pressure becomes so great as to threaten their competitive position. Others may wait until the technical staff threatens to become unionized.

The next concern, of course, is the development of a workable system of recruitment and orientation of new technical personnel. This should be easier if the utilization policy has been carefully formulated. Many colleges and universities have the impression that the campus recruiters sent out by some corporations really do not know what kind of men to hire because the companies do not really know how they will use them after they are employed. At this point, let me say a few things from the viewpoint of the suppliers of your future brain power.

Frequently, recruiters pay too much attention to labels, such as degrees and practical courses, and too little to the essential qualities of character, mind, and spirit of candidates. There has been too much emphasis on hiring college graduates as replacement parts for the existing industrial machine rather than on the quest for men of talent, ideas, and capacity for intellectual growth. After all, our colleges do not train engineers; they educate people for engineering. The training in the practical application of engineering principles is almost solely the responsibility of industry. The task of the college is to give a man broad and basic — and also theoretical education. In a sense, the college can do no more than build intellectual sensitivity into a man — just as color sensitivity is built into the finest photographic films. The development of the skills of the engineer or the scientist takes place only after exposure to the light of practical experience on the job. However, no amount of exposure and practical experience can develop really high talent in a mind which has been sensitized only to simple black and white over-

(Continued on page 170)

# Deep-Sea Transoceanic Cable Telephony

**Submarine cable, providing 36 simultaneous speech channels, uses tubes designed to operate unattended for 20 years on ocean bed**

**by H. A. AFFEL**

**T**HE first deep-sea telephone cable system has been in operation between North America and Europe since the fall of 1956. Within that time the telephone calls between here and the United Kingdom have just about doubled. And the end is not yet in sight. Some of this is normal growth, but a larger part is evidently the result of adding 36 more telephone circuits to those previously provided only by radio. This more than doubles the total number, and the "circuits are busy" situation occurs less frequently. A vital factor in the increased traffic has undoubtedly been the greater continuity of service provided by the new cable in comparison with the previously existing radio telephone circuits.

Another deep-sea telephone cable system, also of considerable length, has been put into operation this fall between the United States and the Hawaiian Islands. This transpacific cable is similar to the transatlantic telephone cable and undoubtedly will have a comparable effect on increasing traffic between the mainland and Hawaii, for here too greater continuity of service is provided by cable than by radio circuits. In both cases, the deep-sea cables are similar, and a description of the earlier transatlantic circuit will suffice to indicate some of the engineering and economic factors that had to be solved in providing this new, long-distance telephone service.

The cable circuits are engineered to insure, for 100 per cent of the time, the kind of transmission provided by the best overland telephone circuits. In the case of the radio circuits, the performance also approaches that provided by the best grade of wire transmission, but the North Atlantic radio transmission path is particularly subject to serious variations, between sunlight and darkness — and during magnetic storms, the result of sunspots and other unknown phenomena. These effects mar the quality of transmission and frequently result in complete interruption of service.

Why have we not had deep-sea telephone cable transmission before, just as we have had deep-sea telegraph transmission for nearly 100 years?

To a communication engineer it is a case of being "between the devil and the deep blue sea." The "devil" in this case is the problem of overcoming the losses that result when trying to transmit telephone currents over a long wire circuit. The deep blue sea is exactly that — how to place in the ocean and keep operating the necessary conductors and equipment to do a satisfactory job.

In the comparison between radio and cable, a crude analogy may be useful. If you were trying to

communicate by voice with a friend in an open field, a quarter of a mile away, you could probably succeed fairly well by putting more lung power behind your words than if your friend were in the same room. If you tried to improve the situation by directing your voice into a small pipe stretched between the two points, the listener would probably pick up more of what you said from the air than from the end of the small pipe — because the pipe exacted too high a toll for its guidance of the sound waves.

Well, it is something like this in the case of radio versus cable for very long distances. The cable has more loss, or attenuation, than the radio circuit. You can put enough energy into the sending antenna of a radio station — it takes many kilowatts, and Nature has to be co-operative — and the receiving station at the distant end will, with sufficient amplification, produce useful sound.

In the case of the long cable, speech tones are higher in frequency than telegraph signals and suffer greater losses. For a speech channel, if one applies considerable energy, even to the point where the insulation of such a cable almost breaks down, scarcely an audible signal comes out at the distant end.

You may ask why cannot one put in only reasonable amounts of power at the sending end of such a cable and make up for the weakness of the voice at the distant end by the use of very powerful amplifiers to restore its volume. But Nature is obstinate. There is another "devil" in reserve. Except at absolute zero temperature (minus 273 degrees C.), the electrons in the conductor are continually moving around in a random fashion. They produce tiny variable voltages which, however small, are real and can be heard as noise in telephone receivers with sufficient amplification. This sets a practicable limit on the amount of amplification that can be employed. A telephone signal can readily be buried by this so-called thermal noise if the amplification exceeds a predictable amount.

Well, what is the answer? It is to apply amplification in a long cable circuit, not only at the end of the long circuit where the voice signal may perhaps be lost in the thermal noise but, as is the practice in long overland circuits, at intervals which are sufficiently short that the desired voice energy never drops so low that it approaches the thermal noise, or any other noise sources.

In overland transmission, this is comparatively simple. It merely means establishing so-called repeater stations with amplifiers in the circuits to boost



the speech power as needed. Sometimes these repeaters are 100 miles apart. In some types of wire circuits they may be as close together as four miles.

But putting amplifiers in a deep-sea cable system is another matter. It took about 25 years of research and development work by the Bell System to solve this problem with the required service reliability.

At the start of the project it was evident that the relatively high cost of submarine cables made it highly desirable that several channels, rather than a single telephone circuit, be provided. Several channels can be provided over a single set of conductors by using so-called carrier systems with a different frequency assignment for each channel. But this takes frequency range—the required spectrum being in proportion to the number of channels. In turn, this means greater cable losses and makes the amplifier problem even more difficult.

As to how to get amplifiers in a circuit across the sea, a good deal of preliminary thinking was done, including exploring the possibility of floating or underwater buoyed repeater stations to which the cable links would be attached. But the decision was reached to try to associate the repeaters intimately with the cable at the bottom of the ocean.

A particular structure was envisioned which, it was hoped, would make the laying of the cable—never a simple matter—as uncomplicated as possible. The housing for the apparatus necessary to amplify the feeble speech sounds was visualized as a long flexible tube, connected in such a fashion that

it represented but a bulge in the cable itself. It should be stored in the hold of a ship with the cable, and payed out around the drums and over the sheaves that form a regular part of a deep-sea laying technique. Great care is needed to be certain that the cable goes in the right place on the ocean bed without kinks or stresses that may jeopardize its life.

In more detail, to the pioneers the problem appeared something like this:

(1) Devise an amplifier which has in it parts something like the typical small radio set and house it in a flexible tube not much larger than the cable itself, capable of withstanding water pressures without leakage up to about 10,000 pounds per square inch.

(2) Have the cables attached to each end and able to withstand a pull of several thousand pounds without ripping the amplifier apart.

(3) At the same time, supply each amplifier with power transmitted with the speech currents over the cable itself. Several dozen such amplifiers strung along the cable must be supplied with power at the same time.

(4) Furthermore, do not neglect to design each component in the amplifier, and the structure which houses it, to have a very long life (20 years or more) under continuous service. Otherwise it may be necessary frequently to pull up the cable and replace the amplifier or its components.

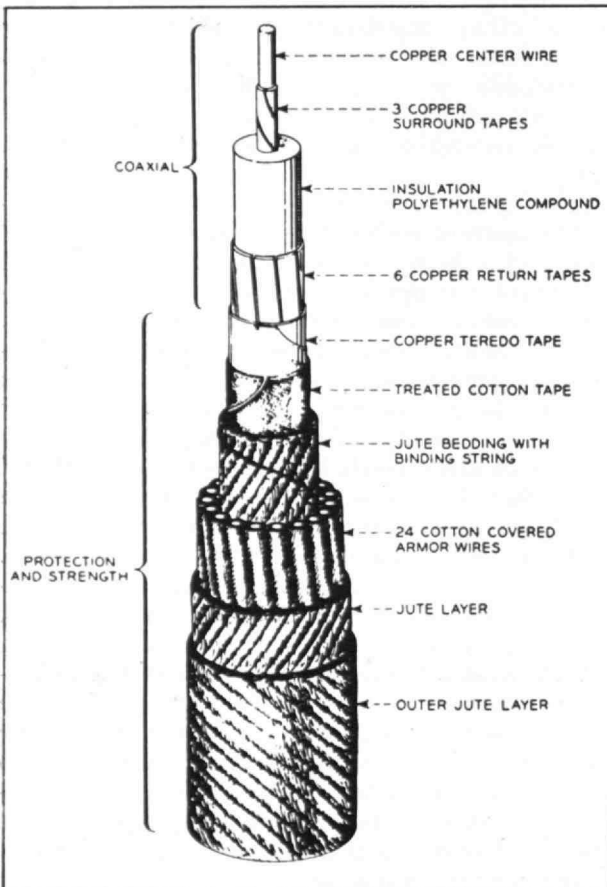
With all of these requirements it is not difficult to see why it took so many years to achieve and fully test a design to a degree which would warrant the risk of completing a transatlantic cable installation costing more than \$40,000,000.

The objectives were achieved and the transatlantic cable has, as noted, been in successful operation for some time. It may be added, also, that a pilot installation of the same general design, over a shorter circuit, has been in operation for more than seven years between Key West, Fla., and Havana, Cuba. A similar type cable installation between Seattle, Wash., and Ketchikan, Alaska, was completed early in 1957 to improve commercial and military services to that territory. Furthermore, as noted, an installation between the Pacific Coast and Hawaii, identical in principle but somewhat longer than the transatlantic cable, was put in operation early in October.

All of these deep-sea installations employ essentially the same underwater repeater techniques. Actually, there are two cables, one for each direction, laid from 10 to 20 miles apart on the ocean floor. Repeaters are spaced about 40 miles apart. For example, in the transatlantic cable the Newfoundland-Scotland span is about 2,000 miles. Therefore 51 repeaters are needed in each direction.

A word about the deep-sea cable itself. Modern cables do not look so much different than they did in 1858 when Cyrus Field played a part in laying the first telegraph cable. They consist essentially of a fairly heavy copper conductor surrounded by flexible insulation to keep out the sea water, and then are usually covered with jute and one or more servings of steel wire to supply longitudinal strength and to resist abrasion.

But the modern cables have really been improved in some very important ways which, in particular,



Bell Telephone Laboratories, Inc.

Fig. 1. Structural features of deep-water type of cable. (Approximate diameter, 1 1/4 inches.)

help their use for telephony. First, the current is now given a return path by copper tapes forming a coaxial cylinder over the insulation. This return path, in place of a sea water return, reduces the loss and makes the cable circuits less susceptible to induction from other cables, static, and so on. The second important improvement in cable design is the use of better insulation. The older telegraph cables used gutta-percha. The new cables are made from a high quality polyethylene which improves the transmission considerably, particularly for high frequencies.

A cross-section of the deep-sea portion of the transatlantic cable is shown in Fig. 1. The shore ends are somewhat fatter because more steel wire protection is added on the outside to take care of occasional situations where the anchors of ships may snag the cable. Rocks and icebergs are also hazards. Cable routes are selected to minimize the difficulty from ships' anchors and also from trawlers which, in their effort to snare fish from the deep, have often interrupted transatlantic telegraph communication.

Each repeater is a broad-band amplifier with three stages of vacuum tubes. It transmits a band width from relatively low frequencies to about 144,000 cycles per second. This provides a frequency range for 36 speech channels, each having a band width of more than 3,000 cycles per second, together with space for certain frequencies used in testing the system. If desired, more than one speech channel can be merged to provide a wider band, such as for special radio broadcasts. The total band provided is obviously not sufficient to transmit standard television signals which require a band width of about 4,500,000 cycles per second.

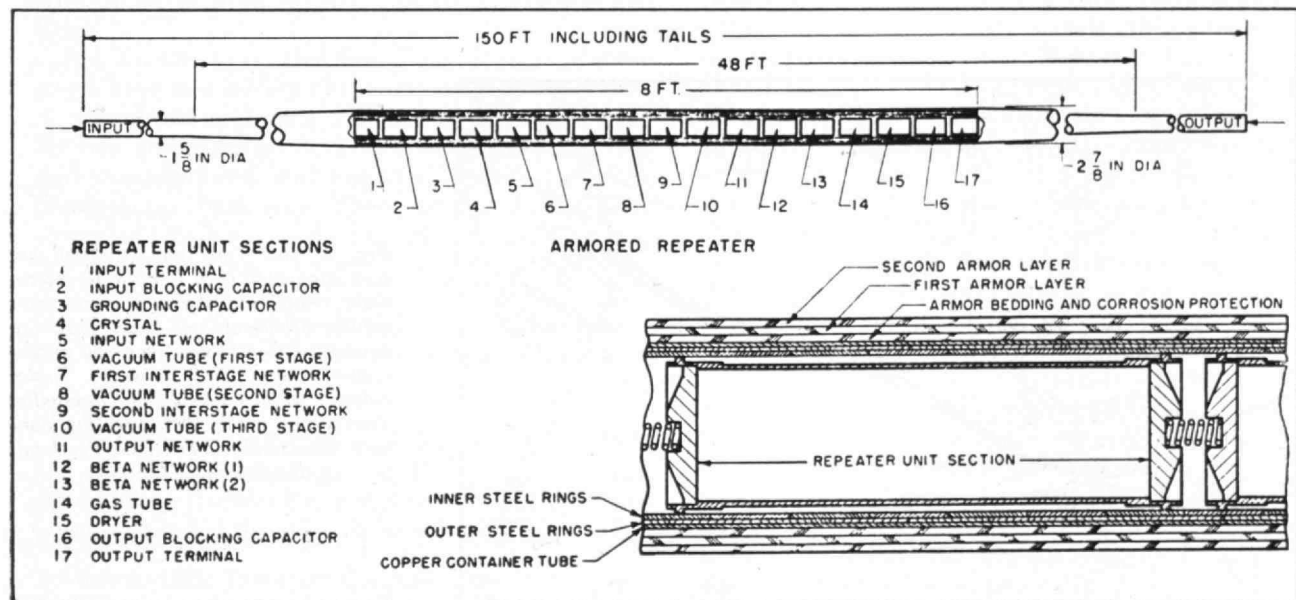
Structurally, the repeater is articulated. The components making up the amplifier are housed individually or in groups in small plastic cylinders about one and one-half inches in diameter and five inches in length. There are 17 such cylinders stacked end to end in the repeater, as shown in Fig. 2. Interconnected, they make up the amplifier circuit. Three of

these cylinders house the special long life vacuum tubes. The stacked cylinders forming the repeater proper total about eight feet in length.

Over them are placed two layers of closely fitting, thin steel rings which overlap each other and afford a necessary element of flexibility. They supply the pressure-resisting strength of the container. Over the steel rings is a thin copper tube about one-thirty-second inch in thickness. This is the water barrier. It is sufficiently soft copper to be flexible. At the ends of the articulated structure are a series of elaborate, welded and otherwise constructed seals so that the cable conductors may enter both sides without allowing water or even water vapor to enter the repeater housing. After the cables are attached to both ends, the steel wires are carefully served over the whole structure to insure great longitudinal strength for the over-all cable-repeater combination. The diameter of the repeater section is then about two and seven-eighths inches.

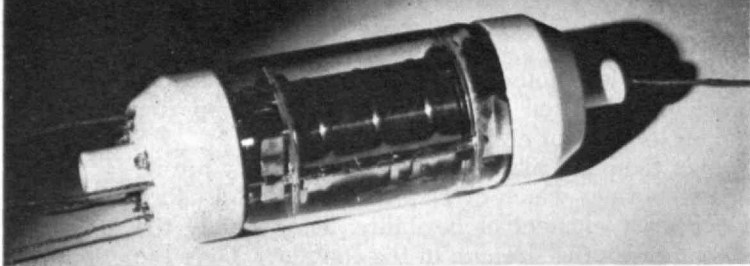
Power is supplied to the tubes by applying positive potential of approximately 2,000 volts to ground to each cable at Clarendville, Nova Scotia, and correspondingly, 2,000 volts negative potential to the two cables at Oban, Scotland, from special high stability, extremely reliable power plants. The current through each cable to operate the tubes, which are, in effect, all in series, is 0.25 ampere, regulated to a constancy of 0.02 per cent. This current flows continuously, without interruption, at all times. From the standpoint of tube life, with such tubes there is actually more harm in turning the current on and off than in allowing it to continue to flow.

Most of the repeaters are connected into the cable at the intervals of about 40 miles before the cable ship leaves the shore. However, some splicing is required during the laying process at intervals of some 200 miles to achieve the precise equalization between the cable losses and amplifier characteristics. A large cable ship, such as the *Monarch*, which is owned by the British Government, makes it possible to carry



Bell Telephone Laboratories, Inc.

Fig. 2. Diagram of structure of submarine repeater built as integral part of deep-sea telephone cable.



Bell Telephone Laboratories, Inc.

Fig. 3. Tube used in submarine telephone cables is conservatively built since it must operate without maintenance at ocean bottom for two decades.

most of the cable and repeaters for a single transatlantic crossing.

If any one of the 300-odd vacuum tubes involved in the two-way transatlantic circuit failed, it would completely disrupt service over all channels. Such an interruption, in addition to the lost service time, might cost several hundred thousand dollars to repair, particularly if it occurred in the deep portion, which exceeds two miles in depth.

A long story could be written about the design of these critical elements. Their development was started early in the planning of the project. The objective was a design which would insure continuity of operation over a period of at least 20 years. This is many times the life of the vacuum tubes used in the average broadcast receiver.

The design of the tubes, one of which is pictured in Fig. 3, is conservative. In particular, the temperature of the filament or emitter is kept much lower than most other vacuum tubes. They are constructed in spotlessly clean, dust-free surroundings with continuous electrical and microscopic inspection to insure that no structural element has inherent weaknesses. Finally each tube is tested on a life rack over a period of several thousand hours—longer than the average life of many vacuum tubes—before it is deemed satisfactory for inclusion in the repeater. Prototype tubes of the type used in the cables were actually tested for over 10 years before the design was approved.

Detailed stories might be correspondingly written about the care in design and construction of all of the other components which make up the repeater, such as condensers, resistors, and so on.

In addition to the deep-sea portion extending from Clarenville, Newfoundland, to Oban, Scotland, about 2,000 miles, as shown on Fig. 4, there is also a section of cable from Clarenville, Newfoundland, down to Sydney Mines, Nova Scotia, about 300 miles in length. This is in comparatively shallow water and a repeater technique, perfected by the British engineers, is employed. In this case, the repeaters are housed in tank-like containers and only one cable is used for both directions of transmission.

From Sydney Mines the telephone circuits derived from the cables are brought into Montreal and New York by connection to a repeated microwave radio system. Between Sydney Mines and Portland, Maine, this system includes 19 radio relay repeater points spaced about 30 miles on the average.

The ownership of the transatlantic cable project is vested in the American Telephone and Telegraph Company, British Post Office, Canadian Overseas Telecommunication Corporation, and the Eastern Telephone and Telegraph Company.

The conception and early work on the deep-sea cable and repeaters are due, in large measure, to the vision and efforts of men like Oliver E. Buckley, Oliver B. Jacobs, and John J. Gilbert, all of whom are now retired. Dr. Buckley was president of the Bell Telephone Laboratories; Mr. Gilbert was in charge of the project for some time, and Mr. Jacobs made important contributions to the over-all design of the system over many years. Many others, literally hundreds, including a fair share of M.I.T. graduates, played vital parts in the design, construction, and final laying of the various transoceanic cable systems.

For those having an interest in the detailed technical problems involved in this cable enterprise, reference should be made to the *Bell System Technical Journal* of January, 1957, or, for an abbreviated version, the 1955 *Report of the Smithsonian Institution*.



Fig. 4. New York and Montreal are now connected with London by microwave relays and deep-sea underwater cables. Montreal and New York are connected to Sydney Mines by microwave relays. Shallow-water cables connect Sydney Mines and Clarenville. Two cables, one in each direction, connect Clarenville and Oban, Scotland, a distance of 2,000 miles.

Bell Telephone Laboratories, Inc.



# The Other Three

**In addition to the Erie, three other canals terminating in New York prospered mightily during the Nineteenth Century. But new modes of transportation caused their lingering death in the Twentieth Century**

**by FREDERIC W. NORDSIEK**

**T**HE colorful doings on the old Erie Canal, the trade artery that, in 1825, linked the Atlantic seaboard with the Great Lakes and established New York as the leading city of the United States, are fabled in song and story. Folk singers, professional and amateur, nowadays are often heard to croon:

"Oh, the E-ri-ee was risin',  
And the gin was gittin' low,  
And I scarcely think we'll git a drink,  
Till we git to Buffalo."

Of the many American works of fiction written around the Erie Canal, one of the best known is Walter D. Edmonds' *Rome Haul*.<sup>\*</sup> About halfway through this frothy but entertaining yarn, Dan Harrow, the hero, is talking with Molly Larkins, his "cook,"† about their mutual desire to go to New York some time. They exchange hearsay information about the wonders of that city. Molly says, "You can see boats from four canals, there, all to once." This would have been an historically correct statement any time from the 1830's to the end of the Nineteenth Century. Boats from the famed Erie Canal were of course to be seen then along the New York waterfront as they were towed there in trains, by steam tugs, down the Hudson River from Albany, eastern terminus of the Erie.

But it is safe to say that few, if any, readers of these pages have any inkling of the other three canals that, in prairailroad and early railroad days, poured fuel, lumber, and farm produce into New York, and carried manufactured and imported items—including immigrants—back west. These canals, like the Erie, struggled into being in the face of financial and engineering difficulties, prospered mightily during the heyday of canal transportation, and then died lingering deaths as the railroads tightened their competitive strangle hold, all within the compass of less than a century. These "other three" canals are shown on the map on page 160.

The Delaware and Hudson Canal, opened in 1828 and closed in 1898, began at Honesdale, Pa., and ended in the Hudson River at Kingston, N.Y., whence boats descended the river to New York City.

<sup>\*</sup> Boston: Little Brown and Company, 1929.

†This euphemism was applied to the common-law wives who lived with many of the Erie boatmen.

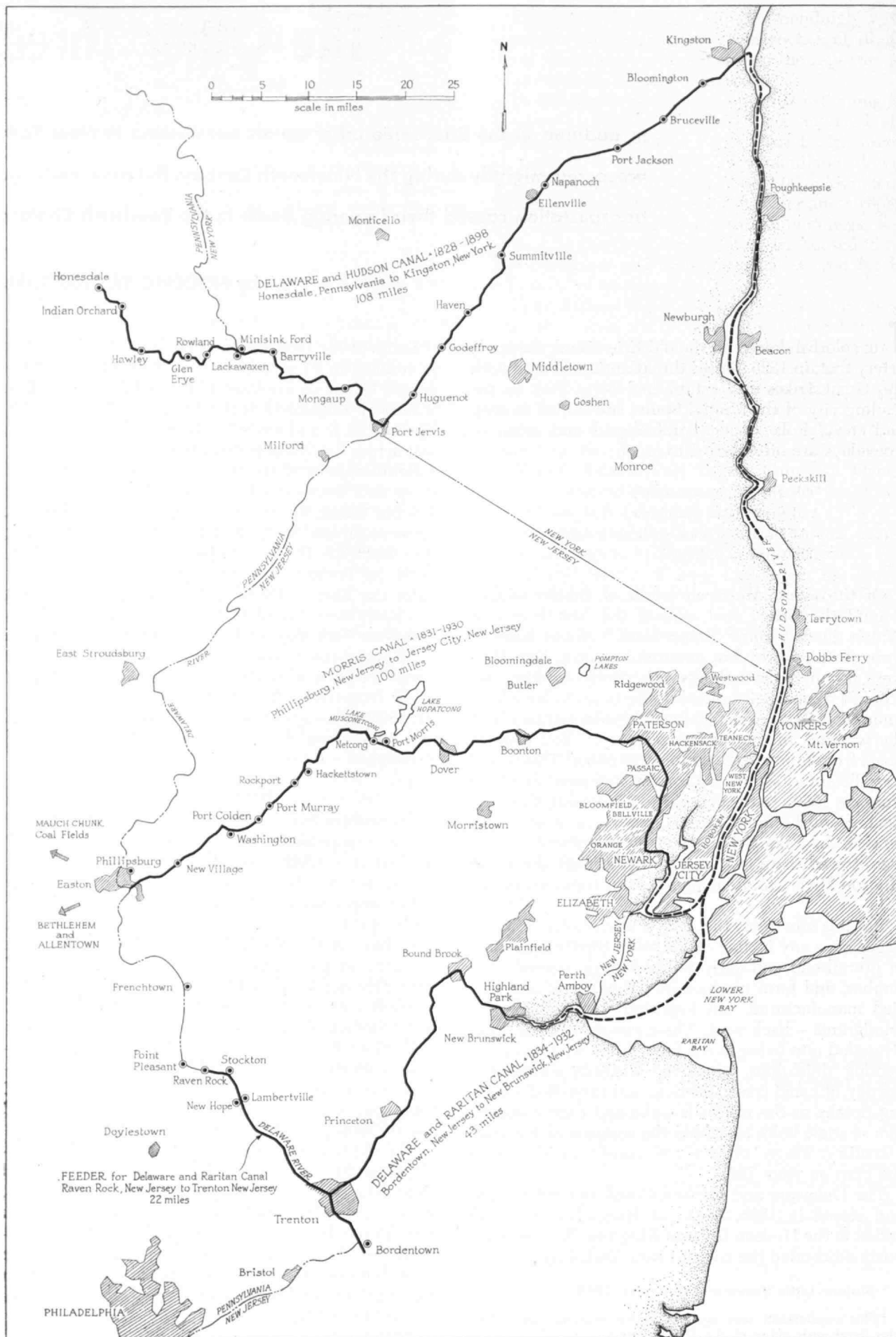
South of the Delaware and Hudson Canal and, like it, running in a generally east-west direction, was the Morris Canal, in use from 1831 until the 1920's. This waterway originated at the Delaware River at Phillipsburg, N.J., and ran 100 miles to end at Jersey City, just across the Hudson River from New York.

Southernmost of the trio is a canal that today still exists as a recreational waterway, the Delaware and Raritan Canal, finished in June, 1834, and closed to commercial use in 1932. This canal, 43 miles long, runs from the Delaware River at Bordentown, N.J., north to Trenton, and then crosses New Jersey to enter the Raritan River at New Brunswick. Thence the boats were towed to New York via Raritan Bay and New York Bay, or by an alternative more sheltered water route west and north of Staten Island. At Trenton this canal is joined by a "feeder," or tributary canal from the north, that starts at the Delaware River 22 miles upstream at the town of Raven Rock, and runs along the east bank of the Delaware to Trenton.

## Boat Canals

These three canals were boat canals, a sort that has totally disappeared from the American scene but networked all settled areas of the country in the mid-Nineteenth Century. Today's American canals are either ship canals or barge canals. Ship canals, like the Cape Cod Canal from Buzzards Bay to Cape Cod Bay, or the Welland from Lake Erie to Lake Ontario, can pass large ships of sizes capable of navigating the ocean or the Great Lakes, and serve either as short cuts or as means of access to large inland water bodies. Barge canals, exemplified by the New York State Barge Canal that today parallels or coincides with the route of the old Erie Canal, accommodate power-driven barges with capacities up to 1,000 tons, and serve to connect coastal waterways and similar somewhat sheltered water routes.

The old boat canals were earth-sided ditches, usually some 30 or so feet broad, with manually operated locks. The boats, of capacities not exceeding 100 tons, were manned by crews numbering two or three, and were drawn by horses or mules walking along a tow-path. Speeds were limited to three or four miles per hour, both because the animals could go no faster on the long hauls and because greater speeds would have created turbulence in the water sufficient to erode the earthen banks.



◀ *The "Other Three." In prerrailroad days, these three boat canals supplemented the famed Erie Canal in pouring freight (largely coal) into New York City, and hauling manufactured and imported items back toward the west.*

## Engineering the Canals

Construction of the boat canals was a major engineering triumph of the day. Indeed, striking parallels exist between the obstacles overcome by the old canal engineers and by the designers of today's superhighways, such as the New York Thruway or the Pennsylvania Turnpike. Superhighways must have minimal grades; so did the canals in order to minimize the number of locks, whose construction was costly and whose operation slowed traffic. Other roads, however minor, must be carried over superhighways on viaducts; vast numbers of bridges had to be built across the canals for this purpose. Superhighways cross rivers on large and costly bridges; canals accomplished such transits by means of the most extraordinary of all of the canal structures, aqueducts.

Aqueducts were troughs of water supported on bridges. The weight of the water in these devices made their design particularly difficult, with the result that the cream of the engineering talent of the day was brought to bear upon the problem. John A. Roebling, who 30 years later was to gain lasting fame by designing the Brooklyn Bridge† in 1848 built a wire cable suspension aqueduct to carry the Delaware and Hudson Canal across the Delaware River near Lackawaxen, Pa. This structure had four spans, ranging in length from 132 to 142 feet each. According to Roebling himself, in a statement he wrote in 1849, the water in the 142-foot span alone weighed 484 tons! The enduring character of Roebling's work is evidenced by the fact that, when the canal closed, this aqueduct was converted to a highway bridge, and today is still carrying a steady flow of traffic between Minisink Ford, N.Y., and Lackawaxen. Is it not thus the oldest suspension span still in use in this country?

Further analogy between superhighways and the old canals may be cited in connection with tunnels. The Pennsylvania Turnpike goes through seven tunnels in order to maintain its grades between Harrisburg and Pittsburgh; the old boat canals were similarly put through tunnels when necessary. This was done in a day before the knowledge of methods later gained in constructing railroad tunnels was available, when blast holes had to be drilled by hand and blasting was done with black powder and temperamental fuses. A canal tunnel may be seen today along the remains of the Chesapeake and Ohio Canal that ran from Washington, D.C., to Cumberland, Md. Neither the Delaware and Hudson, the Morris, nor the Delaware and Raritan went through tunnels; but the decision not to so construct the Delaware and Hudson greatly speeded the demise of this canal. Upon reaching Port Jervis, 48 miles east of Honesdale, western terminus of the canal, its builders faced the Shawangunk Mountains. Tunneling through this range would have permitted the bringing of the canal straight towards New York, its ultimate goal. But in

view of the staggering difficulties of tunnel construction in those days, the canal was planned to bend sharply to the northeast at this point, and to follow the valleys of the Neversink River and Rondout Creek out to the Hudson River at Kingston. But here the boats were almost as far from New York, as the crow flies, as they were where the canal started at Honesdale. The only gain was that the boats now floated in tidewater and could readily be towed to New York. Later, when the Erie Railroad was built through Port Jervis, it penetrated the Shawangunk Range through a tunnel; thus it was able to go straight to New York and to gain an economic advantage that, before very long, put the Delaware and Hudson Canal out of business.

## Up and Down

Although the three canals to which this article is devoted meandered back and forth a good deal in order to follow contour lines and thus maintain a level bed, nevertheless they had to ascend and descend considerable distances in order to reach their goals. The Delaware and Hudson Canal descended from a 967-foot altitude at Honesdale, Pa., to 480 feet at Port Jervis, N.Y. Then it climbed back to about 530 feet in the vicinity of Summitville, N.Y., and finally came down again almost to sea level at its end at Kingston.

The Morris Canal climbed 830 feet from the Delaware River to Lake Hopatcong, its highest point and incidentally also its principal source of water. Then the Morris descended an equal distance to its termination at Jersey City. The Delaware and Hudson achieved its ups and downs by means of conventional locks — 107 of them. But the Morris threw canal evolution into reverse by employing mostly inclined planes. Inclined planes were used on the canals of ancient China, whereas the canal lock was not invented until the Fifteenth Century. The manually operated locks on the boat canals had a practical limit of rise or fall of about 10 feet at the most. Greater depths not only would have resulted in an undue waste of water when boats locked through, but also would have necessitated lower gates too heavy for efficient operation. That is why the Delaware and Hudson Canal needed more than 100 locks to overcome a total change in level of some 600 feet. The Morris, contrariwise, had only 24 locks. Inclined planes, 23 in number, were used to achieve 1,438 feet of the total 1,661-foot rise and fall. Thus, on the average, the inclined planes each took care of a change in level of more than 60 feet. The planes worked by drawing the boats, one at a time, into cradles that ran on inclined tracks. The cradles were hauled to the top of the inclines by means of water power derived from the upper level of the canal.

About 1830 both the Morris and the Delaware and Hudson were striving to obtain more stockholders in order to finance improvement and expansion of their facilities. They both issued promotional literature, written largely around the relative advantages of locks versus inclined planes. But both canals were put out of business by the railroads before the question was really resolved by long-term practical experience.

† E. H. Cameron, "High Road to Brooklyn," *The Technology Review*, 48:419 (May, 1946); 48:487 (June, 1946).



The 1826 annual report of the Morris Canal states that \$4.00 per day was the fee paid for "man, boy, horse, and boat." This sum covered wages for a man to steer the boat and a boy to drive the draft animal, feed and rental of the beast, and rental of one of the 25-ton boats then in use. The loaded boats traveled some 20 or 25 miles a day, so 25 tons could be hauled 20-odd miles for a direct outlay of \$4.00! Thus is pointed up the main feature of canal transportation — low cost.

The turnpikes of the prerailroad era served well enough for passenger transportation but were expensive for haulage of merchandise or freight. In 1800 the cost of hauling goods 30 miles by road equaled that of transportation all the way from Europe by sea. At that time, coal could be brought from Newcastle, England, to Philadelphia more cheaply than domestic coal could be brought from Virginia by road. When the Delaware and Hudson Canal was first opened, coal was brought by wagon from the Lackawanna Valley coal fields to the canal at Honesdale. For this trip, a horse was able to move three tons of coal. Once at the canal, a horse was able to move a boat holding 50 tons of coal! True, the canals were frozen shut three or four months of each year, but in those days roads were impassable at least as long because of snow and spring freshets.

In England, where some of the old boat canals are still in use, there is sentiment for a swing back to boat canal transportation, even today, with railroads operating all year around. The basis of such reasoning is that the low friction of canal operation means low operating and maintenance costs. Moreover, a canal boat weighs only a fifth as much as its load, whereas a railroad car weighs from half to three quarters as much as its load.

### Coal at Their Heels

The Duke of Bridgewater, English canal pioneer (whose canal, opened in 1761, launched the canal era in Great Britain), wrote: "A navigation [canal] should always have coals at the heels of it." He applied his own dictum in extreme measure, because his canal, designed to bring coal from Worsley to Manchester, actually entered his mine at Worsley, and ramified for some 40 miles underground.

But the Delaware and Hudson, the Morris, and the Delaware and Raritan Canals all conformed to Bridgewater's rule; Pennsylvania coal was at their heels, and hauling coal to New York was a major source of their revenue. They were built with this objective in view; thus is demonstrated remarkable vision on the part of their proponents, for, around 1820, steam engines were few in number, central heating of buildings did not exist, and wood for fuel purposes was plentiful. Indeed, the promoters of the Delaware and Hudson Canal found it necessary to arrange public demonstrations in New York of the virtues of their coal as a fireplace fuel. Moreover, in its first years, this canal actually carried more cordwood for fuel purposes than it did coal. Yet in their heyday each of the three canals had to be widened

and deepened several times, their locks were reconstructed to accommodate larger boats, and they were operated after nightfall with the help of flares and lanterns in order to feed New York's insatiable appetite for coal. In 1872 the Delaware and Hudson carried a total of 1,700,403 tons of freight, of which 1,409,628, or 82 per cent, was coal.

The Morris Canal in 1845 carried a total of 58,259 tons, of which 28,221 tons was coal. Six years later, 1851, business had boomed so that 536,362 tons, including 298,011 tons of coal, were carried. Thus, while the total tonnage had increased about tenfold, the proportion represented by coal rose from 48 to 55 per cent.

Pennsylvania coal entered the Delaware and Raritan Canal in boats that were locked into the feeder canal at Lambertville, N.J. The boats originated at the coal fields at Mauch Chunk, Pa., whence they followed the Lehigh Canal for 47 miles to Easton, Pa. There they could either cross the Delaware River and enter the Morris Canal, or could proceed south on the Pennsylvania Canal. If they followed the latter course they could reach Philadelphia by remaining in the Pennsylvania Canal to its end at Bristol, Pa., then continuing to the city via the Delaware. If they were New York bound, they locked into the Delaware at New Hope, Pa., crossed the river to Lambertville, N.J., then locked into the Delaware and Raritan Canal feeder.

In 1866, its peak year, the Delaware and Raritan Canal carried 2,857,233 tons of freight, of which 83 per cent was coal.

### Passengers by Canal

Today excursionists may take short but delightful trips on the Chesapeake and Ohio Canal near Washington, D.C., or on the Pennsylvania Canal near New Hope, Pa. Both of these disused boat canals have been preserved as recreational waterways, and both are now equipped with scows having benches to accommodate sight-seers. These craft are towed by mules in authentic fashion. The one in Pennsylvania is steered by a man who was a mule boy when this canal operated commercially.

On the old boat canals passengers were a minor but far from inconsequential item of traffic. Canal travel was slow, but immeasurably more comfortable than the alternatives — wagon or horseback via turnpike. Combined freight and passenger boats with crude accommodations carried people at low cost and appealed to immigrants heading west. Deluxe packet boats provided for the more fastidious passenger, although he had to pay as much as \$0.04 a mile — big money in the 1830's. By using selected teams of horses, frequently relayed along the route, crack packet canal boats were able to average a dizzying four miles per hour. But by proceeding at night as well as by day, they were able to cover some 100 miles in 24 hours. There was also good business in local travel; thus the Morris Canal had a thriving packet boat line running between Paterson, N.J., and Newark, N.J., a distance of 14 miles. The Morris also advertised a special summertime passenger feature —

*(Continued on page 164)*

# BUSINESS IN MOTION

## *To our Colleagues in American Business . . .*

When you drive into a gasoline station and ask the attendant to, "Fill 'er up", you may not be aware of it, but in the storage tank beneath the concrete on which your car is standing there may be an electric motor and pump submerged in the gasoline. There is quite an interesting story about this explosion-proof motor.

The use of the positive displacement type of pumping unit in service station operation has presented vapor-lock problems to pump manufacturers for many years. And with the introduction of even more volatile gasoline, present pumping systems have become inoperative in some applications. The use of a submersible pumping unit in the gasoline storage tank therefore has become not only desirable but virtually a necessity.

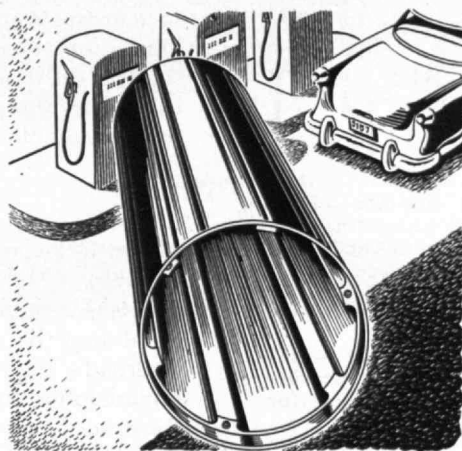
In designing the pump motor for this type of unit a leading manufacturer had originally planned on using an aluminum casting for the stator, or outside shell of the motor. But when the design engineers considered the factors that would be encountered, and the symmetry of shape, it appeared that an aluminum extrusion might have advantages over a casting.

At this point the manufacturer recalled the numerous Revere copper and brass parts they had been using in their motors over the years, with the utmost satisfaction, and how Revere's T.A. (Technical Advisory) Service had often helped them with similar problems. The result was a huddle with a Revere Technical Advisor to discuss the various pros and cons of castings versus extrusions.

It was found that, by using extrusions there would be no problem of porosity which is often present in the case of castings. Substantial savings in weight would also be made as the wall thickness of the stator shell could be reduced, and the only machining would be to the ribs on the inside of the tube. With an extrusion no machining of the outside of the tube is required, which would be necessary should a casting be used, while the smoother surface on the inside improves flow characteristics. This is an important factor in this particular pump motor since the fluid being pumped passes between the stator core and the extruded shell, while in the conventional submersible pump motor a double shell is used. Also, with the smooth surface of an extrusion, less horsepower is used to pump a given volume of fluid. The result was the hollow Revere Aluminum Extrusion you see sketched at left, measuring 13-9/16" long by 3-1/2" O.D.

Here you have still another example of Revere cooperating with the customer in selecting the right metal in the right form to do the best job with the greatest economy . . . be it aluminum, copper or any one of their alloys.

Not only the copper and brass industry but practically every industry you can name is able to cite similar instances. So we suggest that no matter what your suppliers ship you, it would be a good idea to take them into your confidence and see if you cannot make a better product at lower costs by specifying exactly the right materials.



**REVERE COPPER AND BRASS INCORPORATED**

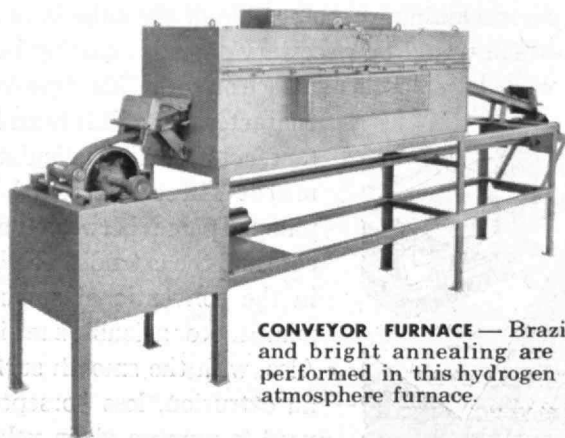
*Founded by Paul Revere in 1801*

**Executive Offices: 230 Park Avenue, New York 17, N. Y.**

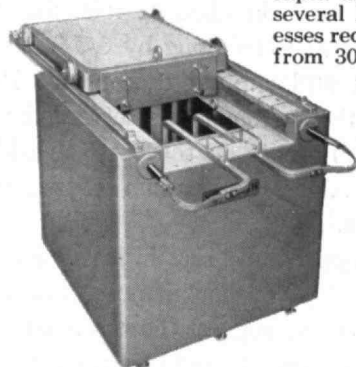
# HEVI-DUTY

## IN STEP with tomorrow's stepped-up DEMANDS

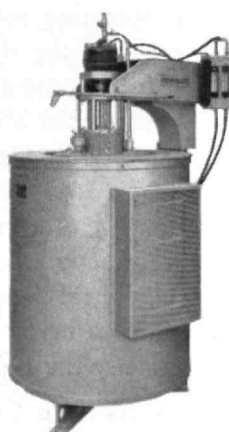
### INDUSTRIAL HEAT-TREATING FURNACES



**CONVEYOR FURNACE** — Brazing and bright annealing are performed in this hydrogen atmosphere furnace.



**SALT BATH FURNACE** — Immersed electrodes provide rapid and uniform heat for several heat-treating processes requiring temperatures from 300° F. to 2300° F.



**VERTICAL RETORT FURNACE** — A removable sealed retort makes this furnace ideal for carburizing, nitriding, and many other heat-treating processes.

## HEVI-DUTY ELECTRIC COMPANY

MILWAUKEE 1, WISCONSIN

Harold E. Koch, '22, President  
Elton E. Staples, '26, Vice President  
Chester Meyer, '36, Assistant Secretary

### THE OTHER THREE (Continued from page 162)

cool rides on boats carrying ice from outlying ice-houses to the city.

Perhaps some of the passengers on the boat canals were not insensitive to the exquisite scenery they floated through so tranquilly. Across the wooded or rustic countryside, the canals wound through verdant river valleys, sometimes entering rocky gorges. In July, 1841, Washington Irving traveled the length of the Delaware and Hudson Canal. From Honesdale he wrote ecstatically to his sister in Paris, saying in part, "For upward of ninety miles I went through a constant succession of scenery that would have been famous had it existed in any part of Europe."

Certainly some of the canal passengers preferred to stay out of doors during their trip; a memoir on the Erie Canal published in the 1820's records that protests were received from passengers about having to leave the deck every time their packet boats passed under one of the numerous low bridges which were built at minimal height in order to minimize the cost of construction. Also recorded is the indignant rejoinder of a canal official who replied that if the passengers did not like it they could just stay off the canals, as there were plenty of excellent turnpike roads available expressly for their accommodation.

### The Canals Today

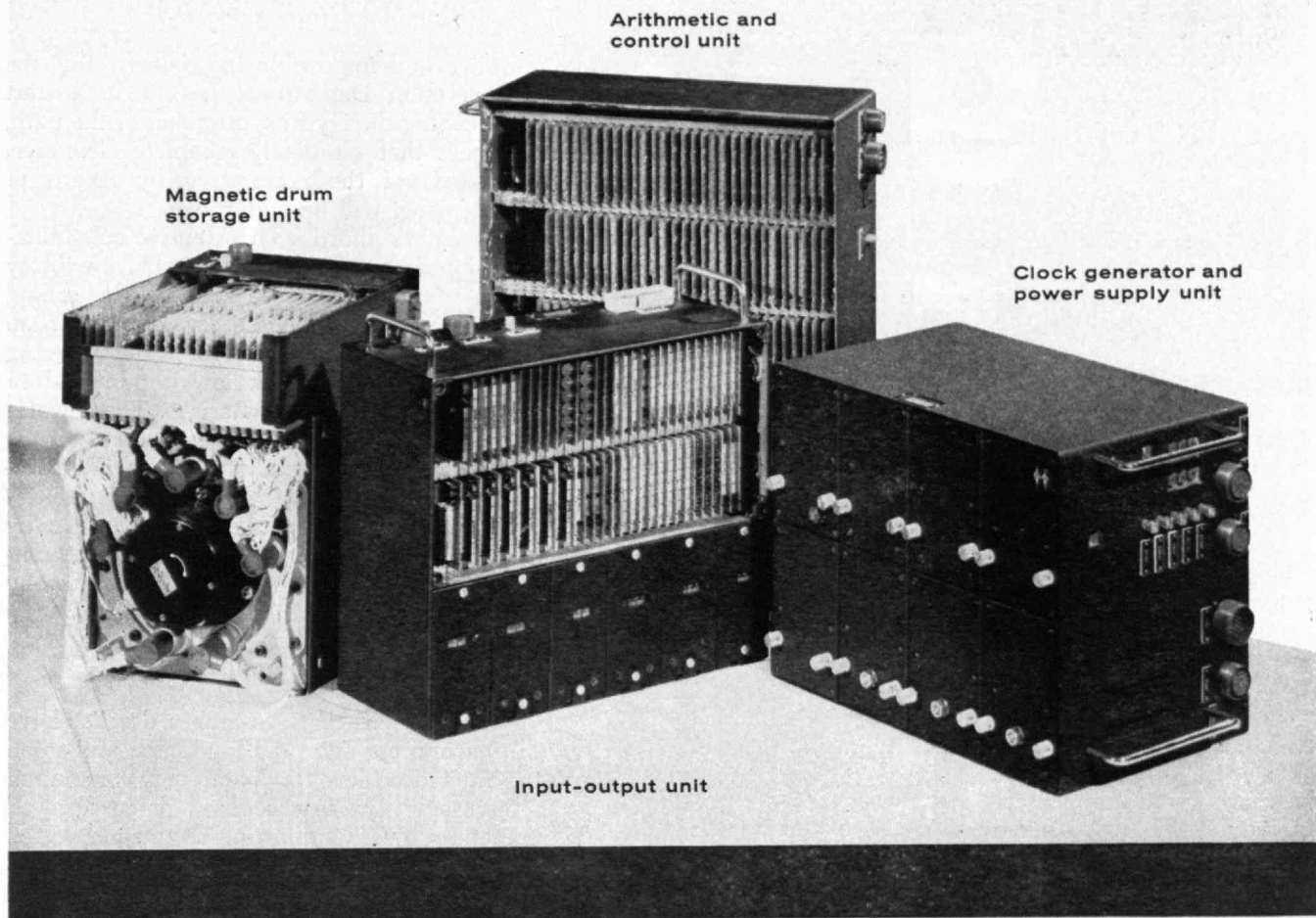
The Delaware and Raritan Canal exemplifies the happiest of fates for a disused boat canal — preservation by public authorities as a park area. This canal may be seen by riders on the Pennsylvania Railroad's busy main line between New York and Philadelphia, for where the trains cross the Raritan River at New Brunswick, N.J., the canal, running along the west bank of the river, is plainly visible from either side of the train.

In 1934, two years after this canal was closed, the state of New Jersey took possession of it. At each of the locks a dam was built, equipped with sluice gates to pass flood waters. Thus the waterway, sheltered from the wind by its banks and, like all boat canals, having practically no current, became an ideal route for canoeists and fold-boaters, who easily portage their light craft around the dams that replaced the locks.

Towpaths make inviting footpaths for the hiker — indeed, it was hiking that led the writer into his interest in canals. For engineering reasons that cannot be set forth within the space limitations of this article, the old boat canals were built at levels well above those of the rivers they paralleled. Thus, for the pedestrian, the towpath of the Delaware and Raritan Canal provides idyllic, ever-changing, bird's-eye views of the Raritan and Millstone Rivers and their valleys. The path is accessible only to pedestrians or canoeists; hence it teems with unharrassed fauna and flora. Its flora, alas, brings us to the anticlimax. Poison ivy has flourished on the towpath, whose sparse rocky soil is ideal for this vicious pest. The growth is so luxuriant as to make passage diffi-

(Continued on page 166)





## The Importance of DIGITAL TECHNIQUES

Digital techniques constitute one of the important developments which have made possible the recent advances in computers and related equipment for computation, data processing, and industrial and military electronic control.

Digital computers for scientific computation range from small specialized units costing a few thousand dollars, to large general-purpose computers costing over a million dollars. One of these large computers is a part of the Ramo-Wooldridge Computing Center, and a second such unit is being installed early this year.

Electronic data processing for business and industry is rapidly growing based on earlier developments in electronic computers. Data processors have much in common with computers, including the utilization of digital techniques. A closely related field is that of industrial process control. To meet the needs in this field, Ramo-Wooldridge has recently put on the market the RW-300 Digital Control Computer.

The use of digital techniques in military control systems is an accomplished fact. Modern interceptor aircraft, for example, use digital fire control systems. A number of Ramo-

Wooldridge scientists and engineers have pioneered in this field, and the photograph above shows the RW-30 Airborne Digital Computer.

The RW-30 is an example of what can be accomplished through the application of digital techniques in conjunction with modern semiconductor components. It performs complete mathematical operations, including multiplications, at the rate of 4000 per second (as fast as large scientific computers). Yet it occupies only 4.19 cubic feet, weighs 203 pounds and uses 400 watts power. It is packaged in four separate units to facilitate installation in aircraft. The magnetic drum memory has a capacity of 2607 21-bit words.

The versatility inherent in digital techniques makes it possible for the RW-30 to handle such varied military aircraft problems as navigation, armament control and bombing, and combinations of these problems, without changes in the RW-30 itself.

*The RW-30 also serves to illustrate the balanced integration of systems analysis and product engineering which is a principal objective at Ramo-Wooldridge. Similar programs are in progress on other airborne and electronic control systems, communication and navigation systems, and electronic instrumentation and test equipment. Engineers and scientists are invited to explore openings in these fields at Ramo-Wooldridge.*

## The Ramo-Wooldridge Corporation

5730 ARBOR VITAE STREET • LOS ANGELES 45, CALIFORNIA

FLETCHER **g** ranite

**r** standardized curb

dimension m **a** sonry

broke **n** ashlar

bridge p **i** er facing

bound pos **t** s

thin v **e** neers

Quick Delivery 100%

## H. E. FLETCHER CO.

WEST CHELMSFORD, MASSACHUSETTS

☎ LOWELL—ALPINE 1-4031

114 EAST 40TH STREET, NEW YORK 16, N. Y.

☎ OXford 7-4131

## THE OTHER THREE

(Continued from page 164)

cult in winter and impossible in summer. But the State Conservation Department has made a start toward bulldozing the ivy from stretches of the path, and announces that ultimately complete clearance, and destruction of the poison ivy by means of herbicide spraying, will be undertaken.

How can a state afford such extensive rehabilitation and maintenance of a defunct canal? New Jersey pays part of its bills for these activities by selling canal water. The levels of the Delaware and Raritan Canal are such that Delaware River water entering the feeder canal at Raven Rock flows the breadth of the state and empties into the Raritan. These water rights came into possession of the state when it took over the canal. The water is sold to industrial users along the canal route, and also to communities who have found that it can be made potable by suitable treatment. Currently the state sells 39.9 million gallons per day of the canal water, thereby gaining a revenue of more than \$100,000 a year.

### Canal Memorabilia

But even the canals that are totally derelict have left a lasting impress upon the landscape and upon the map. Their dead-level towpaths may be spotted by the discerning eye in woodland or in farmers' fields, sometimes even within towns; and may often be followed for many miles, bringing one upon remains of locks and other memorabilia. Have you ever wondered why so many eastern towns, near no body of water, are called "ports"? Follow a chain of them with your finger on a map, and you will be tracing the course of an old canal; for these were once thriving canal ports. Thus, in New Jersey, Port Colden, Port Murray, Rockport, Port Morris, and others mark the route of the Morris Canal.

Most of the former canal ports today are little more than names on the map; the names frequently do not appear on latest issues of maps made by the U.S. Geological Survey. Others, like Port Jervis, N.Y., have had a different fate. The locale of this community was first just a junction of two rivers, called Carpenter's Point. When the Delaware and Hudson Canal opened, a bustling canal port soon sprang up here and was named for John B. Jervis, chief engineer of the canal, who had learned his specialty helping to design the Erie Canal. The Erie Railroad put the quietus on the Delaware and Hudson Canal, but this railroad found Port Jervis to be a strategic location for extensive yards, shops, and roundhouses. The town survived, in time added manufacturing and summer hotels to its resources, and ultimately became a city.

### Old Canal Structures

Use of the abandoned aqueduct of the Delaware and Hudson Canal, near Lackawaxen, for a highway bridge has been mentioned. For a time the city of Rochester, N.Y., had an abortive rapid transit sys-

(Concluded on page 168)



American Cyanamid Company  
 Anaconda Aluminum Company  
 Atlas Powder Company  
 Caterpillar Tractor Company  
 Corning Glass Works  
 General Electric Company  
 General Mills, Inc.  
 General Motors Corporation  
 International Business Machines  
 Johns-Manville Corporation  
 Koppers Company, Inc.  
 Mead Corporation, The  
 Monsanto Chemical Company  
 New York Central System  
 New York Life Insurance Company  
 Phelps-Dodge Corporation  
 Revere Copper & Brass Company  
 Socony Mobil Oil Company  
 U. S. Atomic Energy Commission  
 Westinghouse Electric Corporation

Florida  
 Montana  
 Tennessee  
 Colorado  
 Ohio  
 North Carolina  
 Ohio  
 Michigan  
 Kentucky  
 California  
 Pennsylvania  
 Tennessee  
 Missouri  
 Michigan  
 Illinois  
 New York  
 Illinois  
 Wyoming  
 Nevada  
 New Jersey

## LEADING INDUSTRIALS CHOOSE THE VP

Not only do many of the nation's leading industrial companies—such as those listed above—buy VP Boilers, but also a long list of smaller companies and institutions have VP package boiler installations.

The choice of the "big" companies, however, has some special significance. They buy boilers frequently—therefore, their experience is always up to date. They buy them in all capacities large and small. Their requirements justify employment of highly qualified engineering specialists—both staff men and

outside consultants. Thus, they have the breadth of experience and the expert guidance requisite to making the soundest equipment selections.

So—if you are in the market for boilers in the capacity range from 4,000 to 50,000 pounds of steam per hour, we submit that you can buy with confidence the boiler chosen by so many of the nation's largest industrialists—the C-E Package Boiler, Type VP. A new descriptive catalog, VP-3, is just off the press. Write for your copy.

## COMBUSTION ENGINEERING

Combustion Engineering Building • 200 Madison Avenue, New York 16, N. Y.



C-130

ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT; NUCLEAR REACTORS; PAPER MILL EQUIPMENT; PULVERIZERS; FLASH DRYING SYSTEMS; PRESSURE VESSELS; SOIL PIPE





RUNS AS SMOOTH AS A

## BROOK MOTOR



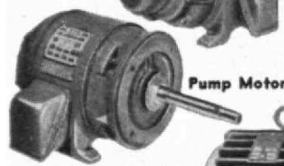
Dynamically balanced rotors, precision ground shafts, superior bearings, assure a smooth flow of power from a BROOK. Built to resist temperature extremes, moisture, oil and dust. NEMA specifications or better. From 1 h.p. to 600 h.p.

### FAST DELIVERY OF ALL POPULAR MODELS!

Brook motors are available from warehouses at Chicago, Atlanta, Dallas, Houston, Jersey City, Los Angeles, Lubbock, San Francisco, St. Paul, Salt Lake City, Seattle, Memphis, Tampa, and other major distributing points.

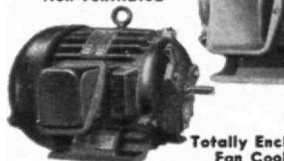


Single-Phase



Pump Motor

Totally Enclosed, Non-Ventilated



Totally Enclosed, Fan Cooled



SINCE 1904

**BROOK MOTOR CORP.**

3553 W. PETERSON AVE.,  
CHICAGO 45, ILL.

## THE OTHER THREE

(Concluded from page 166)

tem that ran in the dry bed of the old Erie Canal. Lock houses — dwellings for lock tenders — on the Chesapeake and Ohio Canal were built in enduring fashion from solid stone. When this canal became a public park, these buildings were offered for sale as homes; many have been bought by people who do not mind owning a house on land they can never own. Lock House No. 1, where this canal began, may be seen today in Washington near the White House at the corner of 17th Street and Constitution Avenue. It is perfectly preserved and duly labeled with bronze tablets as an historical site; but it also serves a utilitarian function as a public toilet.

West of Port Jervis a resident has dammed a bit of the otherwise dry Delaware and Hudson Canal to make a slightly duck pond. The town of Waterloo, N.J., has similarly dammed and flooded a stretch of the Morris Canal that serves the townspeople as a swimming pool in summer and a skating pond in winter. Ice skating on a boat canal before the first snowfall is a special experience; the sheltered, currentless water forms an ice of crystal transparency usually known locally as "black ice." Skating on this surface, especially if none has gone before, is a sensation akin to free flight. Black is an appropriate funereal color for canal ice, as it was the freezing of the canals for several months each year that made them succumb before the competitive onslaught of the year-round railroads.

### Escape from Reality

Aside from the interest of ice skaters, canoeists, hikers, and conservationists in preserving at least remnants of the boat canals, these old waterways have become a strong focus of that particular escape from rude present-day reality that finds its outlet in antiquarian interests. On October 13, 1956, at Buffalo, N.Y., a Canal Society of New York was formed to pursue such nostalgic ends.

Thus the old boat canals, though long gone from the scene, will probably not soon be forgotten. Will such a mellow fate befall the railroads, that in their day killed the canals, but are now locked in lethal struggle with air lines, busses, trucks, and pipe lines?

### BIBLIOGRAPHY

1. Morris Canal and Banking Company, *Review by a Stock Holder* (February 10, 1831).
2. Hill, Henry W., *Waterways and Canal Construction in New York State* (Buffalo Historical Society, 1908).
3. de Maré, Eric, *Canals of England* (London: Architectural Press, 1950).
4. LeRoy, Edwin D., *The Delaware and Hudson Canal — A History* (Honesdale, Pa.: Wayne County Historical Society, 1950).
5. Torrey, Raymond H., et al, *New York Walk Book* (New York: American Geographical Society, 1951).
6. Sloane, Eric, *Our Vanishing Landscape* (New York: Funk and Wagnalls Company, 1955).
7. *The Delaware and Raritan Canal — Historical Data* (Trenton: State of New Jersey, Department of Conservation and Economic Development, December, 1956).

## JUST PUBLISHED

NEW • ENLARGED • REVISED

EDITIONS OF

## Smoley's Tables



350 New Pages

Time Savers for Designers & Builders since 1901. Check items of interest to you:

- |  |                |
|--|----------------|
| <input type="checkbox"/> Logs and Squares<br>Parallel Tables increased 100' to 300'          | <b>\$ 6.00</b> |
| <input type="checkbox"/> Slopes & Rises (Tables doubled)<br>192 bevel pages increased to 384 | <b>6.00</b>    |
| <input type="checkbox"/> Log. Trig. Tables<br>areas and circumferences extended              | <b>1.50</b>    |
| <input type="checkbox"/> Three Combined Tables   | <b>10.00</b>   |
| <input type="checkbox"/> Segmental Functions   | <b>5.00</b>    |
| <input type="checkbox"/> Four Combined Tables  | <b>12.00</b>   |

Mail Orders & Inquiries to:

**C. K. Smoley & Sons, Inc.**

P.O. Box 14, Chautauqua, N. Y.

*Massachusetts Mutual announces*

*—Premium Rate Reductions*

*—Lower Rates for Larger Policies*

*—Additional Savings for Women*



Massachusetts Mutual is now offering nearly all of its life insurance policies at lower premium rates.

Also, you save when you buy a larger policy! The rate per \$1,000 steps down when you buy a \$5,000 policy . . . further down on a \$10,000 policy . . . still further down on a \$25,000 policy. Why? Because our handling expense per \$1,000 is lower on larger policies.

For women, there are important additional savings. Massachusetts Mutual has made women *three years younger* than men—in terms of life insurance premium rates.\* Why? Because women live longer than men.

And the Massachusetts Mutual policy contracts continue to be outstanding for their quality, flexibility, and liberality.

Ask your Massachusetts Mutual man to show you what our new premium rates can mean to you in year-after-year savings and in security for your family. Or call our General Agent listed under "Massachusetts Mutual" in your phone book.

\*In a few states, because of statutory limitations, women will pay the same premium rates as men, but will receive higher dividends under our 1958 schedule.

*Massachusetts Mutual*  
LIFE INSURANCE COMPANY  
SPRINGFIELD, MASSACHUSETTS  
The Policyholders' Company



# Sangamo Electric Company offers you an exciting and challenging career

Other MIT graduates\* have found satisfying opportunity and fitting rewards with Sangamo—a pioneer manufacturer of electric metering apparatus and control equipment. Sangamo has steadily grown in stature since 1899, through sound, progressive management; engineering vision; and an outstanding reputation for quality of products. These include electric meters, power capacitors, time switches, dynamotors, generators, electronic capacitors, recording instruments and military equipment. Besides the main plant in Springfield, others are situated at Pickens, South Carolina, and in Canada, England and Scotland.

Now is the time to inquire about your opportunity at Sangamo. Ask your college placement officer or write directly to Sangamo's Training Director.

\* These MIT men hold important and worthwhile positions with Sangamo Electric Company:

Edward A. Leach, class of 1927  
Vice-president in charge of Engineering

Roy Ide, class of 1930  
Chief Chemist, Pickens Division

Herbert Johnson, class of 1943  
Chief Engineer

**SANGAMO ELECTRIC COMPANY**  
SPRINGFIELD, ILLINOIS, U.S.A.



## EXECUTIVE

knows that all will go well  
at the plant because electrical  
construction and maintenance  
have been handled by

## A. J. WOLFE COMPANY

2 Harris Avenue, Jamaica Plain

Call JAMAica 4-1222 . . . Our 35th Year

## HIGH-TALENT MAN POWER

(Continued from page 154)

vocationalized college training. The engineering or scientific specialties of today may not be those which will be important tomorrow. Thus, industry should search for minds with the capacity to grasp new ideas, rather than just for specialized technicians who can make an immediate contribution to problems which may be of only transitory urgency.

It is difficult, of course, to spot this kind of talent just by interviewing the candidate for a few hours, giving him some tests, or even talking to his professors who presumably know him best. The interviewer can screen out men who are too timid or too brash to be likely to succeed, but the interview is not much more than a salesman's call. Psychological tests are useful, but they are more effective in determining shortcomings than in discovering high talent, and teachers unfortunately do not always know the students as well as you might assume. In the last analysis, motivation, emotional maturity, and intellectual capacity are best tested over time and in the light of resistances and pressures. For this reason, the really progressive companies attempt to employ men in the summer vacations before graduation. In this way, both the company and the man can test out each other.

The placement and orientation of the new recruit is also of critical importance. There is, I feel, an overemphasis on immediate monetary offers in the attempt to attract and hold young men of high talent. And, as a rule, such young men are by temperament and education more concerned with individual accomplishment than with automatic or across-the-board impersonal rewards. It is poor policy, I think, for a company to pay the same salary to all engineers of a type regardless of their relative contribution, for this merely wastes the value of differential rewards to men of particularly high talent who are most sensitive to the symbols of individual accomplishment.

Furthermore, no amount of pay will satisfy the man who thinks that his time is being wasted, who feels that his supervisor does not understand the nature of professional work, who thinks that his opportunities to learn are limited, or who fails to get individual credit for the ideas he advances. Indeed, the worst mistake in dealing with men of high talent

(Continued on page 172)

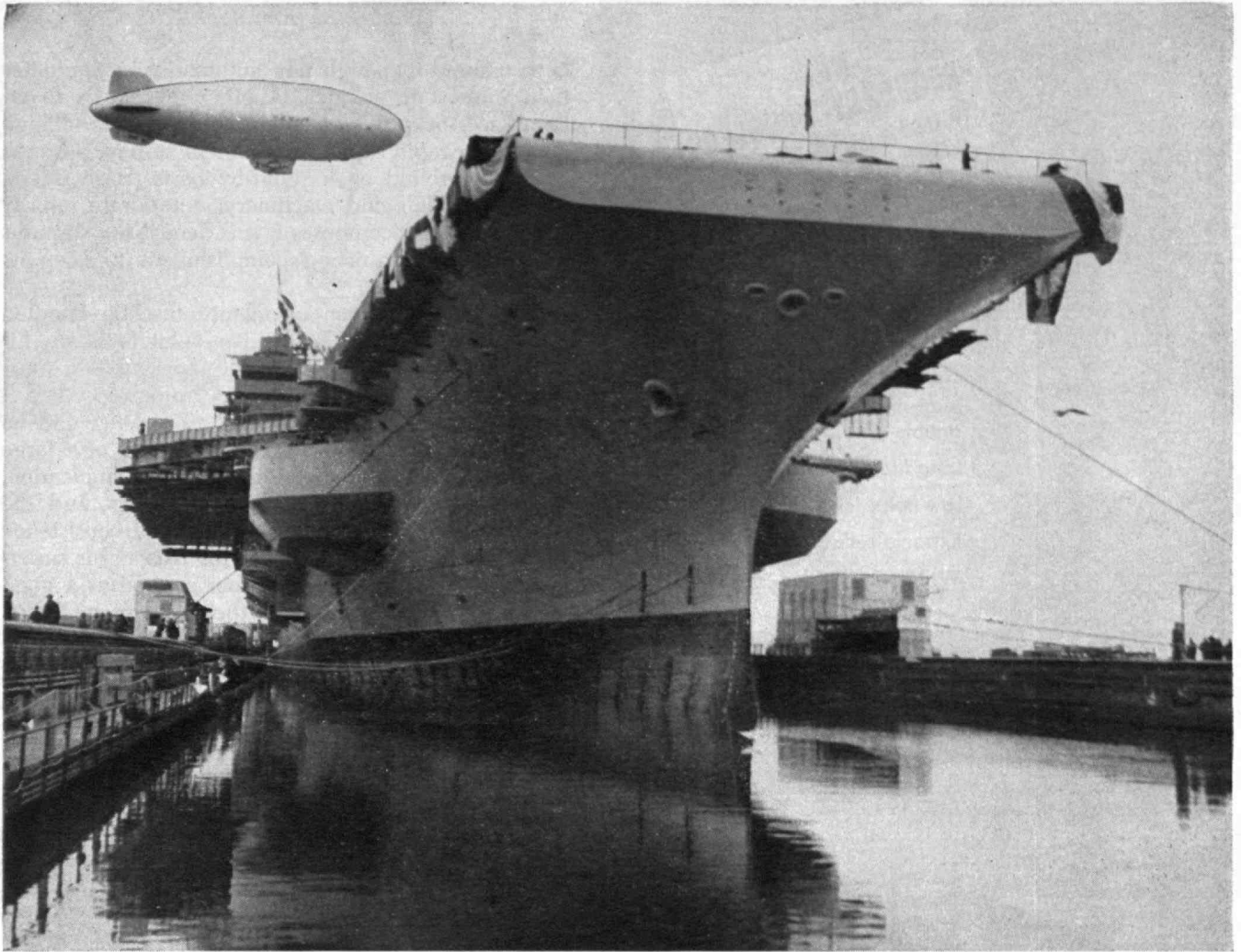
## William H. Coburn & Co.

INVESTMENT COUNSEL

68 Devonshire Street

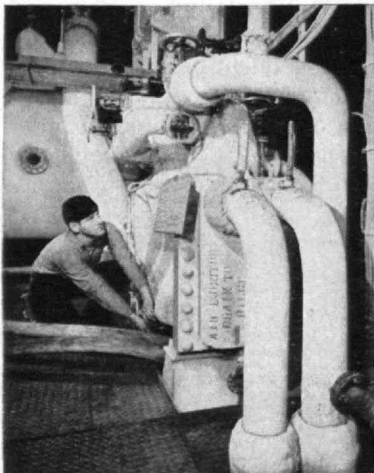
Boston



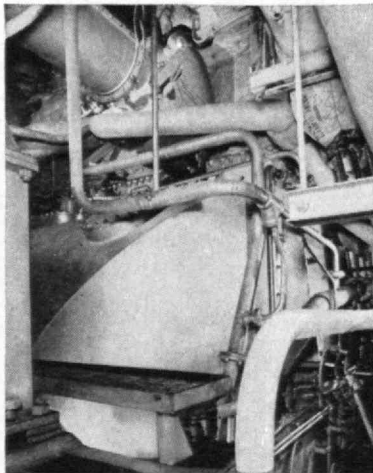


*The U.S.S. Forrester (above) and the U.S.S. Saratoga are both fitted with equipment engineered and built by C. H. Wheeler. The U.S.S. Ranger, the U.S.S. Independence and the U.S.S. Kitty Hawk, now under construction, will also be Wheeler-equipped.*

## SUPERCARRIERS NEED "SUPER" EQUIPMENT



*Vacuum Drain Tank Ejector, built by Wheeler, which has been installed in the U.S.S. Saratoga, sister ship of the U.S.S. Forrester (above).*



*Main Condenser (forward) on U.S.S. Saratoga. Nearly all U.S. Navy ships—even atomic submarines and supercarriers—have Wheeler equipment aboard.*

The nation's two new "super-equipped" supercarriers now afloat, the U.S.S. Forrester and U.S.S. Saratoga, contain marine machinery custom-engineered and precision-built by C. H. Wheeler. The three supercarriers which are now under construction, the Independence, the Ranger and the Kitty Hawk, will also use Wheeler equipment.

On the Saratoga are two Wheeler Marine Condensers, which in combination with newly-designed turbines, develop 200,000 horsepower to drive this beautiful 60,000-ton supercarrier in excess of 30 knots. Wheeler Anchor Windlasses, Ordnance Elevators, Capstans, Winches, Auxiliary Gland Exhaust Condensers and Distilling Plant and Vacuum Drain Ejectors are also installed on the 1,040-foot Saratoga.

*Marine Division*

**C-H-Wheeler Mfg. Co.**

19TH & LEHIGH AVENUE

Philadelphia 32, Pennsylvania

**NEW  
FREQUENCY DOUBLERS**

- Double the sampling rate
- Double the band width
- Eliminate zero offsets

**DC-AC  
CHOPPERS**

Twenty-two types,  
both single and  
double pole.

Long life.

Low noise level.

Extreme reliability.

Write for Catalog.

**STEVENS  
INCORPORATED  
ARNOLD**

7 ELKINS STREET  
SOUTH BOSTON 27, MASS.

S/A-10C

**NOW...**

*Even More*  
**Heat-Exchange Capacity**

*Even Less* **Air Friction**

with **AEROFIN**  
*Smooth-Fin*  
**Heating and Cooling Coils**

Write for Bulletin S-55

**AEROFIN CORPORATION**  
SYRACUSE 1, N. Y.

## HIGH-TALENT MAN POWER

(Continued from page 170)

is to assume that high pay automatically liquidates their interest in an idea. Another mistake is to attempt to stockpile high talent against times of high demand or rapid expansion — that is, to have a bunch of brains around on a stand-by basis. High talent, unlike materials and machinery, deteriorate rapidly if not used; it decomposes if it is denied the stimulus of growth; it requires accomplishment to keep its tone.

Obviously, the man of talent must be handled carefully. Of course, he too has a lot to learn; his rough edges require some sandpapering. He must learn that the time span from a brilliant idea to a change in production is usually quite long; and he must understand also the deliberate pace of a large organization, the uncertainties of communication, the delays involved in getting clearances, and the need for a certain amount of order and consistency in the handling of people. For this reason, his supervisor needs to be a good teacher as well as a good manager, and he must have the capacity to direct, rather than to stifle, aggressiveness and initiative on the part of the newly hired engineer or scientist who much-too-often has an all-too-high opinion of himself and a quite-too-low respect for the wisdom of his more experienced associates. Here again we are face-to-face with the **problem of management and the selection and development of high-level supervisors, administrators, and executives.**

All corporations can help educational institutions do a better job in preparing persons for scientific and technical careers. They can establish closer connections with colleges through arrangements for co-operative students and co-operative teachers. They can encourage students in high schools to prepare themselves better in mathematics, English, and science. And, of course, they can and should provide financial assistance to the institutions which are capable of doing a good job. But, companies should not confine their interest to programs for increasing the numbers of technical people who enter and graduate from colleges. They should be even more concerned with the quality of talent being developed.

Here again, I cannot stress too strongly the necessity for broad education of those planning to enter engineering, for firm grounding in mathematics, in

(Continued on page 174)

**SCULLY SIGNAL COMPANY**

**Safe Fills** } with  
**No Spills** } **VENTALARM®**  
WHISTLING TANK FILL SIGNAL

for automotive, home  
and diesel fuel tanks

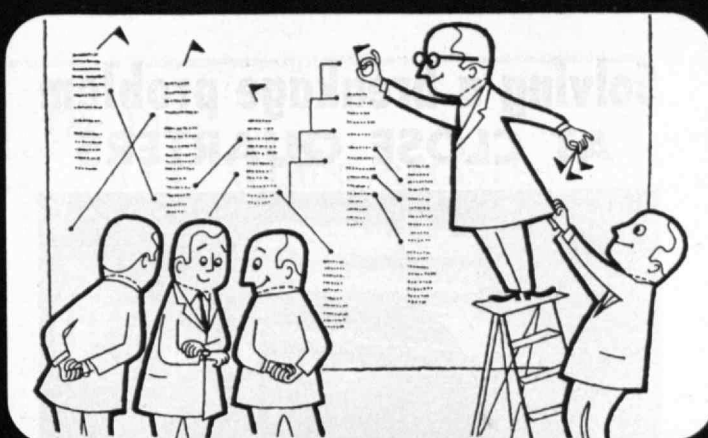
F. P. Scully '15

174 Green Street, Melrose 76, Mass.

**"JUST FILL 'TIL THE WHISTLE STOPS"**



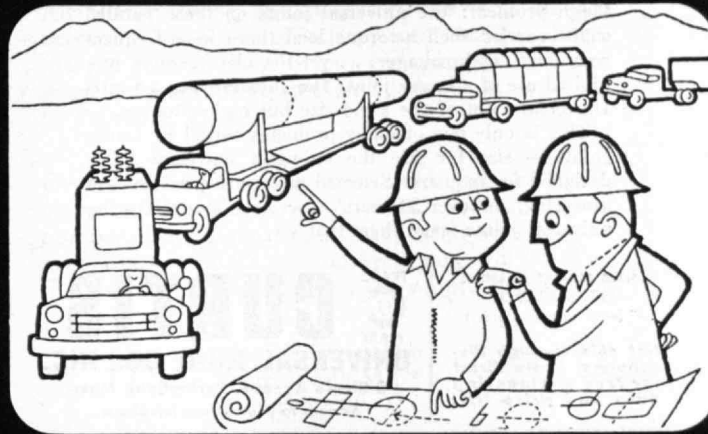
Your choice of Lummus to build your new plant is the starting gun in a race to meet or beat the completion date.



First, Lummus' Coordinating Group sets up a master schedule, a timetable for all activities on the project.



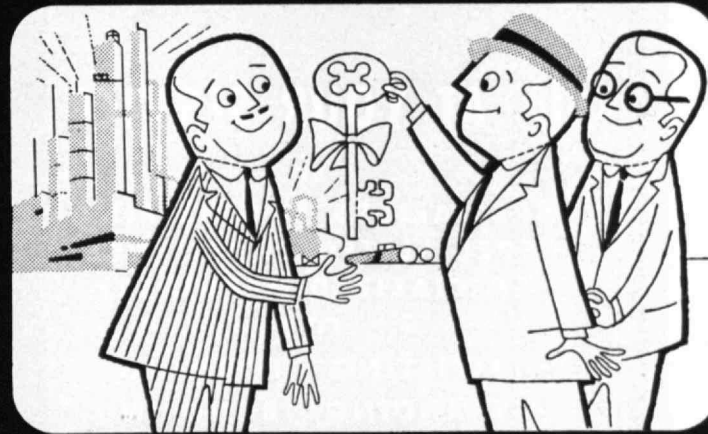
Deadlines are set for supplying critical information to design, engineering and construction groups . . .



. . . and for the purchase and delivery of key equipment in the proper construction sequence.



Thousands of details are checked, rechecked, entered on the calendar for carefully timed action.

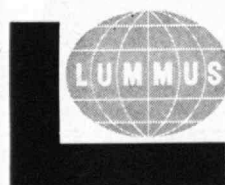


All together, these things mean on-time completion . . . an art Lummus has reduced to a science.

## How to beat the clock for \$10,000,000

Not least among the skills required to build a multi-million dollar process plant is the ability to make the whole intricate job come out on time. The day you sign a contract with Lummus, a group of specialists in the art of getting things done goes into action. Their work continues without let-up until the last instrument is recording process data. Here is another reason why it's faster—and usually more economical—to let Lummus design, engineer and build your new plant than to risk your start-up date on a do-it-yourself approach.

**THE LUMMUS COMPANY**  
385 Madison Avenue, New York 17, N. Y.

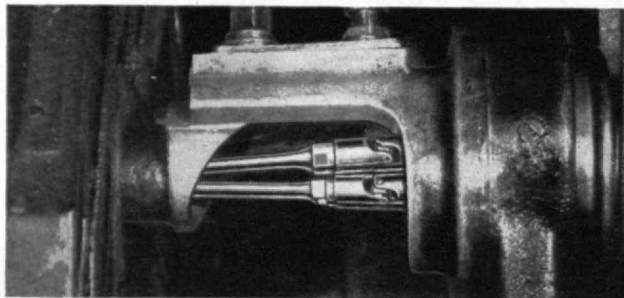


**ENGINEERS AND CONSTRUCTORS FOR INDUSTRY**

HOUSTON • CHICAGO • MONTREAL • CARACAS • LONDON • PARIS • THE HAGUE • BOMBAY



# Solving a breakage problem AT CLOSE QUARTERS



The manufacturer of this button-drilling machine had a tough problem: the universal joints on these parallel shafts carried such a torque load there were frequent complaints of breakage . . . yet the close centers prohibited use of a larger joint. **The solution** was a Curtis Universal Joint of the same size but higher torque.

This is only one of many problems solved by Curtis Joints — size for size the strongest universal joints designed for industry. Selected materials, precision engineering, and over 30 years' experience manufacturing universal joints make them that way.

14 SIZES ALWAYS IN STOCK  
3/8" to 4" O.D.  
(6" joints on special order)

Not sold through distributors. Write direct for free engineering data and price list.

TRADE  
©  
MARK

**CURTIS**  
**UNIVERSAL JOINT CO., INC.**

8 Birnie Avenue, Springfield, Mass.

As near to you as your telephone

EXCLUSIVELY A MANUFACTURER OF UNIVERSAL JOINTS SINCE 1919



**AT YOUR SERVICE**



**SPECIALIZED ENGINEERING  
SPECIALIZED EXPERIENCE  
SPECIALIZED MACHINERY**

**FOR**

**TWISTING • FORMING  
STRANDING • BUNCHING  
COTTON • JUTE • MANILA  
SISAL • NYLON • DACRON  
ORLON • SARAN • PAPER  
POLYETHYLENE • GLASS**

**TEXTILE • WIRE • CORDAGE  
and OTHER INDUSTRIES**

**HASKELL-DAWES  
MACHINE CO., INC.**

**2231 E. Ontario Street  
Philadelphia 34, Pa.**

## HIGH-TALENT MAN POWER

(Continued from page 172)

scientific theory, in comprehensive use and understanding of the English language, and also in the social sciences and the humanities. Industry will sell itself and the younger generation short if it advocates the crowding of the curriculum with too many practical courses, too much attention to techniques and gimmicks; in short, too much emphasis on vocational rather than upon basic education. The practice or the art of engineering is not something that can or should be taught in college. In this respect, the demand on the part of some companies for more practical and more specialized training in colleges is, in essence, an indication only that these companies are not competent to undertake their rightful training responsibilities.

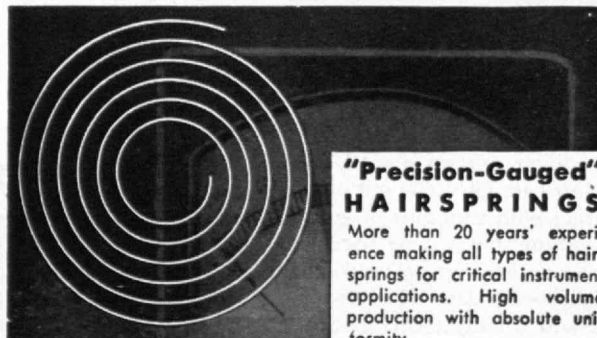
### Conclusion

By way of conclusion, let us briefly examine the impact of the changing structure of man-power utilization upon our thinking in the field of industrial relations.

For the past two decades, collective bargaining with manual workers has occupied the center of the industrial relations stage. Unions have directly or indirectly exerted pressure on all levels of management. As a consequence, there has been a virtual revolution in the handling of human relations in American industry. This has been decidedly beneficial. Unions are here to stay, and collective bargaining has become a permanent and necessary function in business operations. As a result, the freedom, dignity and worth of the individual worker in American society has been greatly enhanced.

Much of our effort in the past has been directed toward treating the common man fairly and equally. Seniority systems have been created to eliminate favoritism and discrimination; job evaluation has been used to provide equal pay for equal work. In working on things such as general wage increases, call-in pay, overtime, compensation for work on Saturdays and Sundays, vacations, pensions, supplementary unemployment benefits, sickness benefits, and related matters, the concern has always been to establish rules for equal and nondiscriminatory treatment of the various categories of manual and clerical

(Continued on page 176)



### "Precision-Gauged" HAIRSPRINGS

More than 20 years' experience making all types of hairsprings for critical instrument applications. High volume production with absolute uniformity.

**PRECISION PRODUCTS COMPANY INC OF WALTHAM**  
WALTHAM 54 • • MASSACHUSETTS



ONE of the designs by Samuel Chamberlain '18 for the M.I.T. Wedgwood dinner-service plates. . . . Orders in sets of eight should be placed with the Alumni Office, Room 1-290, M.I.T., Cambridge 39, Mass., for delivery prepaid in the U.S.A. or Canada at the following prices:

On Queen's Ware at \$24.50  
Limited edition of numbered sets  
on Bone China at \$85.00

## The 1955

### M.I.T. ALUMNI REGISTER

(current until 1960)

**L**ISTING alphabetically within its 642 text-pages: 47,210 living alumni (from Aall, Jacob '50 of Tvedestrand, Norway, to Zych, Edward A. '45 of Chicopee, Mass.); 11,968 deceased alumni (Abare, Lawrence P. '30 to Zitz, Frederick C. '95); 388 members of the Corporation since 1862; 9,119 members of the Faculty and Staff since 1865; and 196 officers and Executive Committee members of the Alumni Association since 1875.

All alumni, living and deceased, are cross-indexed according to Class affiliation; and 44,274 alumni (94 per cent of those living) are cross-indexed geographically according to their addresses as corrected to February 15, 1955.

Over 7,000 copies have been sold and the *cloth-bound edition* is now out-of-print. . . . A limited number of additional copies have been *paper-bound* and orders at \$6.00 per copy postpaid will be filled in order of receipt as long as the supply lasts by the

Alumni Association  
Room 1-290, M.I.T.  
Cambridge 39, Mass.

## BIW MISSILE WIRES & CABLES FLEXIBLE TELEMETERING CABLES

**BIW TYPES PFGF AND SRHT ARE THE BASES FOR A COMPLETE LINE OF WIRES AND CABLES PARTICULARLY DESIGNED FOR MISSILE APPLICATIONS.**

They range in size from #24 to #10 gauge with either 300 or 600 volt ratings. Two and three conductor cables are standard for telemetering with silver-plated copper shield and a protective outer covering.

Both types are made with highly abrasion resistant outer covering to withstand the high temperature and severe abuse of missile service and installation.

Normally these wires are given an operating temperature rating of 500°F. Where missile operation is of limited duration they withstand ambient temperature of 600°F for a limited period of time without failure of insulation.

BIW Types PFGF and SRHT have proved to be superior in two years of use by major missile manufacturers.

— Write for Missile Wiring Catalog —

**BOSTON INSULATED WIRE AND CABLE CO., BOSTON 25, MASS.**

## HIGH-TALENT MAN POWER

(Continued from page 174)

labor. Above all, we have been interested in achieving conformity and consistency. We have become skilled in the arts of classification and categorization. In fact, industrial relations practices may be plagued today with an ailment called "a hardening of the categories!"

But, the skills and the concepts which have been useful in dealing with the common man are not always those most appropriate for dealing with high-talent man power. Today, we have been talking about the engineer, the scientist, the professional person. He is the *uncommon man*, the atypical being, the brainy guy, or the egg-head with queer but nonetheless valuable ideas. When you hire professionally trained people today, you are hiring persons who by their education and their pre-employment indoctrination are individualists and inclined to be nonconformists. They want recognition as individuals, as originators of ideas—as professionals; they are not content to be dealt with by categories.

In dealing with technical man power, therefore, one needs to know how to detect the differences rather than the similarities between people. Objective discrimination and differential treatment are the vital skills required for selection and effective utilization of high-talent man power. But, it is far more difficult for a manager to deal with people differ-

ently than to treat them uniformly. For the last 10 years, industry has been trying to train managers to eliminate discrimination in order to treat all people fairly. Now, it is becoming necessary to help them differentiate in order to motivate outstanding individuals substantially.

There has been both understandable concern and wide speculation regarding the unionization of professional and technical personnel. Some forces tend to favor their unionization. For example, large aggregations of engineers and scientists are now employed in the rapidly expanding research and development laboratories. To the extent that they are treated like other large aggregates of workers, they may logically seek to organize for the purpose of bargaining collectively with management. Professional workers have both aspirations and grievances, and they will not easily submit to the unilateral exercise of authority by any company. It is significant that the few unions of engineers and scientists which exist today have as one of their major goals in bargaining the recognition of the professional interest and status of their members. If management persists in thinking of them as a category instead of as individuals, then the movement toward unionization may gain momentum.

On the other hand, there is good reason to expect that professional personnel will not be organized. Engineers and scientists are in such short supply that

(Concluded on page 178)

## SPECIAL REPORT



Mr. ROLLINS WM. MILLER, JR. NEW YORK LIFE AGENT  
at WASHINGTON, D. C.

**BORN:** June 11, 1921.

**EDUCATION:** Georgetown University, Foreign Service School, B.S., 1950.

**MILITARY:** U.S. Marine Corps—Tech. Sgt., January '42 to November '45.

**PREVIOUS EMPLOYMENT:** March '48 to Sept. '48—U.S. State Dept. Oct. '48 to June '49—Secretary, Dept. of Physics, Georgetown University. March '50 to Aug. '50—Sales Trainee, Manufacturer of Electronic Business Machines. August '50 to August '51—Salesman, Business Machines.

**REMARKS:** Rollins Wm. Miller, Jr., joined New York Life's Washington, D.C., office on August 1, 1951. Each year since, this personable ex-Marine's sales volume has qualified him for membership either in the Company's President's Council or Top Club. He is a Life and Qualifying Member of the industry-wide Million Dollar Round Table. This impressive record makes it seem certain that even greater success lies ahead for Bill Miller, as a New York Life representative.

**Note**

Bill Miller, after six years as a New York Life representative, is already well established in a career that can offer security, substantial income, and the deep satisfaction of helping others. If you'd like to know more about such a career

for yourself with one of the world's leading life insurance companies, write:

**NEW YORK LIFE INSURANCE CO.**  
College Relations Dept. E-26  
51 Madison Avenue, New York 10, N.Y.



# The TREDENNICK-BILLINGS CO.

*Construction Managers*

*Building Construction*

K. W. RICHARDS '07

H. D. BILLINGS '10

C. C. JONES '12

F. J. CONTI '34

10 HIGH STREET

BOSTON, MASSACHUSETTS

**SPECIALISTS  
in  
Pre-Fabricating  
PIPING**



**ALBERT**

PIPE SUPPLY  
COMPANY, INC.

**STEEL PIPE:** Wrought Iron • Steel • Structural • Cast Iron • Copper-Steel • Electric Weld • Seamless • Spiral, Lap & Butt Weld • Shore-Dredge • Speed-Lay

**CEMENT-ASBESTOS PIPE:** For sewerage and water mains where corrosion is a problem.

**ALUMINUM PIPE:** In standard and light walls. All accessories stocked.

**PLASTIC (PVC) PIPE**

**SPEED-LAY:** Complete packaged PIPE SYSTEM for fast-laying, temporary and semi-permanent lines for water, compressed air and other services. Write for catalog.

**VALVES, FITTINGS & FLANGES:** Tube Turns • Dresser • Victaulic • Cast Iron or Steel • Forged Steel • Special Alloys • Water Main

**PILING PIPE:** Cast Steel and Iron Points • Plates and Shoes • Cast Steel • Malleable Iron Sleeves

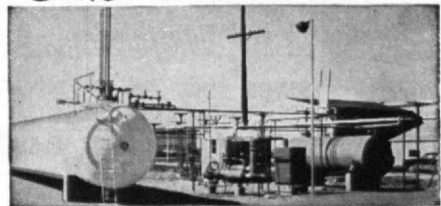
**COMPLETE FACILITIES** for Bending, Coiling, Beveling, Swedging, Flanging, Grooving, Welding, Cutting to Sketch, and Threading to most rigid requirements. Bitumastic or Cement lining — Testing — all to Standard specifications.

S.G. ALBERT '29 • A.E. ALBERT '56

103-1 VARICK AVE., BROOKLYN 37, N. Y.

Tel.: HYacinth 7-4900

## *Gas* **STANDBY**



Packaged 12 mcfh plant designed and built by Draketown for...

- ★ Utility or Industrial standby
- ★ Peak shaving and augmentation
- ★ 100% Town or plant supply

A Packaged Draketown Propane Plant will help you reduce demand charges; provide a supply of gas during curtailment periods... at the turn of a valve... or supply that outlying section or plant 100% if desired.



**PROPANE PLANTS**

"Good Gas Insurance"

If you have a gas problem, we can help you. We operate from coast to coast and overseas.

Phone or write today — no obligation.

**DRAKE & TOWNSEND**

INCORPORATED

Consulting • Design • Engineering • Construction

11 WEST 42ND STREET • NEW YORK 36, N. Y.

BOSTON

NEW YORK

PITTSBURGH

PORTLAND, ORE.



# LORD ELECTRIC COMPANY

INC.

FOUNDER, F. W. LORD, M.I.T. '93

63 YEARS OF EXPERIENCE IN ELECTRICAL CONSTRUCTION



## HOLMES & NARVER, INC.

ENGINEERS • CONSTRUCTORS

JAMES T. HOLMES  
M.I.T. '14

D. LEE NARVER  
STANFORD '14

828 S. Figueroa St., Los Angeles 17, California

Telephone TRinity 8201

## LEONARD CONSTRUCTION COMPANY

*Engineers and Contractors*

**SINCE 1905**

**IN THE AMERICAS AND FAR EAST**

**37 South Wabash Ave.**

**Chicago**

## CHAUNCY HALL SCHOOL

Founded 1828. The School that specializes in the preparation of students for the Massachusetts Institute of Technology.

Ray D. Farnsworth, Principal 533 Boylston Street, Boston, Mass.

## SYSKA & HENNESSY, INC.

*Engineers*

John F. Hennessy '24

John F. Hennessy, Jr. '51



DESIGN • CONSULTATION • REPORTS  
POWER PLANT • WASTE DISPOSAL • WATER SYSTEMS  
New York City



## ROTH LABORATORY FOR PHYSICAL RESEARCH

*Serving Industry in these fields —*

ELECTRONICS      MATHEMATICAL ANALYSIS  
AUTOMATION      RESEARCH MANAGEMENT  
MEDICAL PHYSICS      ANALOG COMPUTERS  
ULTRASONICS      INSTRUMENTATION

Wilfred Roth  
M.I.T. '48  
Columbia '43

**1240 MAIN STREET • JACKSON 7-8474**

**HARTFORD 3, CONNECTICUT**

## HIGH-TALENT MAN POWER

*(Concluded from page 176)*

they can force management to respect their interests as individuals. This has seldom been the case with manual workers. They have usually needed the help of government and the pressure of strong unions to force employers to meet their demands. Men of high talent, on the other hand, can use the pressure of the market to seek their ends. For this reason, perhaps, management will be impelled to deal intelligently with the grievances and aspirations of professional personnel before they come to feel that collective action would be necessary to bring pressure on their employers. In other words, I am suggesting that improvement in the management and motivation of high-talent man power probably will not wait upon unionization except perhaps in a few of our more backward enterprises.

In any case, the future holds many intriguing problems and new challenges for the industrial relations officer. As the staff adviser to top management on human relationships, he will have fresh opportunities to make his highest contribution to his company and to his country as an idea-man, as an innovator, and as a restless fellow more concerned perhaps with forward planning than with the particular problems of the day. He can play his most strategic role as a thinker, a needler, and often a non-conformist. In the area of devising the means for the more effective management and motivation of high-talent man power, he has before him worlds to conquer. And here, unlike the arena of collective bargaining, he may not find so many lawyers moving in to help him do his job!

## meissner *Engineers*

**consultants • engineers • constructors**

*Processing plants. Bulk materials handling and storage. Conveying systems. Ore and minerals processing. Bridge, expressway and interchange design.*

**JOHN F. MEISSNER ENGINEERS, INC.**

**300 West Washington Street  
Chicago 6, Illinois  
ANdover 3-1944**

R. C. MEISSNER '43

## LOCKWOOD GREENE ENGINEERS—ARCHITECTS

*Professional Service from Site Selection to Plant Completion  
Plant Location Studies*

*Site Investigations*

*Complete Design*

*Supervision of Construction*

**REPORTS**

**APPRAISALS**

New York

BOSTON, MASS.

316 STUART ST.

Spartanburg, S. C.

# PROFESSIONAL CARDS

## JACKSON & MORELAND, INC.

*Engineers and Consultants*

DESIGN AND SUPERVISION OF CONSTRUCTION

REPORTS—EXAMINATIONS—APPRAISALS

MACHINE DESIGN—TECHNICAL PUBLICATIONS

BOSTON

NEW YORK

## GANNETT FLEMING CORDDRY AND CARPENTER, INC.

*Engineers*

HARRISBURG, PA.

Branch Offices:

Pittsburgh, Pa. Daytona Beach, Fla. Philadelphia, Pa.  
Expressways, Toll Roads, Bridges and Airports. Traffic &  
Parking, Dams, Water Works, Sewage, Industrial Wastes  
and Garbage Disposal. Appraisals, Investigations and  
Reports.

## EADIE, FREUND & CAMPBELL

CONSULTING ENGINEERS

500 FIFTH AVENUE

NEW YORK 36, N. Y.

*Mechanical — Electrical — Sanitary*

*Air Conditioning — Power — Process Layouts*

James K. Campbell '11

## METCALF & EDDY

*Engineers*

Water, Sewage, Drainage, Refuse and

Industrial Wastes Problems

Airports, Laboratory, Valuations

Statler Building, Boston 16, Mass.

## THE KULJIAN CORPORATION

*Consultants • Engineers • Constructors*

UTILITY • INDUSTRIAL • CHEMICAL

Power Plants (Steam, Hydro, Diesel), Textile Plants,  
Water & Sewage Works, Oil Refineries, Pipe Lines,  
Army & Navy Installations, Air Fields, Hangars

H. A. Kuljian '19

A. H. Kuljian '48

1200 NO. BROAD ST., PHILADELPHIA 21, PA.

## FABRIC RESEARCH LABORATORIES, INC.

*Research, Development, and Consultation*

*In the Fields of Fibrous, Organic, and Related Materials*

1000 Providence Highway

Dedham, Mass.

(At Route 128 and U.S. 1 Interchange)

W. J. HAMBURGER, '21

K. R. FOX, '40

E. R. KASWELL, '39

## GILBERT ASSOCIATES, INC.

ENGINEERS AND CONSULTANTS

607 WASHINGTON ST., READING, PA.

Malcolm G. Davis '25, Vice President Allen W. Reid '12, E. C. Edgar '35  
Steam, Hydro, Diesel Power Plants; Industrial Structures;  
Plant Safety, Labor Relations, Utility Rates, Valuations,  
Reports; Large Scale Purchasing; Industrial Laboratory

New York • Washington

## FAY, SPOFFORD & THORNDIKE, INC.

*Engineers*

Airports, Bridges, Turnpikes  
Water Supply, Sewage and Drainage  
Port and Terminal Works, Industrial Buildings  
Designs Investigations  
Supervision of Construction  
Boston, Massachusetts

## CLEVERDON, VARNEY & PIKE

*Consulting Engineers*

HERBERT S. CLEVERDON '10  
JOHN A. DOW '23

WALDO F. PIKE '15  
HAROLD E. PROCTOR '17

Structural Designs Foundations  
Heating, Ventilating, Electric and Plumbing De-  
signs, Industrial Buildings, Reports, Investigations

120 TREMONT STREET

BOSTON 8, MASS.

## MAURICE A. REIDY

*Consulting Engineer*

BRIDGES BUILDINGS  
STRUCTURAL DESIGNS FOUNDATIONS  
CONSTRUCTION CONSULTANT AND ARCHITECTURAL ENGINEER

*Estimates and Appraisals*

101 TREMONT STREET

BOSTON, MASS.

## CHARLES NELSON DEBES AND ASSOCIATES

ENGINEERS AND CONSULTANTS

Architectural — Mechanical — Electrical — Structural  
— Sanitary

Industrial, Commercial and Municipal Projects

915 EAST STATE ST.

ROCKFORD, ILL.

C. N. DEBES '35

## MORAN, PROCTOR, MUESER & RUTLEDGE

CONSULTING ENGINEERS

Foundations for Buildings, Bridges and Dams;  
Tunnels, Bulkheads, Marine Structures, Soil Studies and  
Tests; Reports, Design and Supervision

WILLIAM H. MUESER '22

PHILIP C. RUTLEDGE '33

415 Madison Ave., New York 17, N. Y.

## BREWER ENGINEERING LABORATORIES

*Consulting Engineers*

*Electric Strain Gage Testing • Stress Analysis  
Strain Gage Amplifiers • Strain Gage Switches  
High Temperature Strain Gages*

MARION, MASS.

TEL. 103

G. A. Brewer '38

S. P. Cammack '57

## CAPITOL ENGINEERING CORPORATION

CONSULTING ENGINEERS

Design and Surveys

Roads and Streets

Sewer Systems

Water Works

Planning

Airports

Bridges • Turnpikes • Dams

*Executive Offices*

DILLSBURG, PENNSYLVANIA

Washington, D. C. Saigon, Vietnam Rochester, N. Y.

Robert E. Smith '41, Vice President





and the prophet replied:  
*"It is well to give when asked, but it is  
better to give unasked, through understanding."\**

## *Gifts by Will*

TO THE

## Massachusetts Institute of Technology

The tale is told of Almustafa, the prophet, who, having awaited for many years the ship that would return him to the place from whence he came, was making the final descent to the shore when the folk of Orphalese crowded about him. They besought him before departing to "disclose us to ourselves, and tell us all that has been shown you of that which is between birth and death."

With words of wisdom, an answer appropriate was given to the woman holding a baby, to the ploughman, to the merchant. Begged one, "Speak to us of GIVING," and the prophet replied:

"It is well to give when asked, but it is better to give unasked, through understanding;

And to the open-handed the search for one who shall receive is joy greater than giving. All you have shall some day be given;

Therefore give now, that the season of giving may be yours and not your inheritors."

Through the years the prophet's words have held true, for even today he who "through understanding" includes the MASSACHUSETTS INSTITUTE OF TECHNOLOGY as a beneficiary in his will can experience thereby a two-fold satisfaction. The successful culmination of his search for a worthy recipient and the anticipated results his generosity will assist in accomplishing. These satisfactions give an added value to the span of man's days and project his usefulness to his fellowmen far into the future.

The Massachusetts Institute of Technology because of the high quality of the education given its students, its effective research work for aiding America in peace as well as in war, and the high character of its governing body and academic staff qualifies as an institution for serving our American ideals for the present and in the years to come.

But the search, the finding, and the anticipated accomplishments are not enough; for without the properly-worded record, man's plan for the future may go awry. Hence the prophet's importuning, "— give now," should be heeded. The giving need not be an immediate physical transaction, for written directions replace the spoken word when the speaker is no longer present, and a donor can frequently make by will a gift which is larger than he can make while living. Truly, *"it is well to give when asked, but it is better to give unasked, through understanding."*

A booklet "Gifts by Will," outlining different forms of bequests to M.I.T., is available to you or to your attorney by writing to:

Director of Development  
Massachusetts Institute of Technology

Cambridge 39,

Massachusetts

\* "The Prophet" by Kahlil Gibran

# ALUMNI AND OFFICERS IN THE NEWS

## Men on the March . . .

In addition to the 38 Alumni recorded on pages 148 and 149, other Alumni advanced to new posts include:

JOSHUA C. WHETZEL'17 as manager of tin plate products, United States Steel Corporation . . . W. ROY MACKAY'19 as superintendent of the rod and wire division, Sparrows Point plant, Bethlehem Steel Company . . . GEORGE F. MAHONEY'25 as city engineer of Torrington, Conn.

ARTHUR L. SAMUEL'25 as resident manager, International Business Machines Corporation Research Laboratory . . . GEORGE WARREN SMITH'26 as New England manager, Elastomer Chemicals Department, E. I. du Pont de Nemours and Company . . . BRADFORD P. YOUNG'26 as assistant vice-president for public relations, Bell Telephone Company of Pennsylvania.

RICHARD H. TINGEY'27 as nuclear power manager, Shipbuilding Division, Bethlehem Steel Company . . . LUDWIG C. HOFFMANN'29 as chief of the Office of Ship Construction, U. S. Maritime Administration . . . EDWARD L. MEARS'30 as general manager, Container and Chemical Specialties Division, Dewey and Almy Chemical Company.

EDWARD F. HILLENBRAND, JR.'33 as assistant director of development, Union Carbide and Carbon Chemicals Company . . . WILLIAM L. SCARBOROUGH'33 as director of manufacture, Acetate-Orlon Division, E. I. du Pont de Nemours and Company . . . TUCKER M. VYE'33 as a director, Gloucester Safe Deposit and Trust Company.

WALTER J. KELLIHER'34 as mayor of Malden, Mass. . . . ROBERT K. ROULSTON'34 as sales manager, Injection Moulding Machine Division, Lombard Governor Corporation . . . RAYMOND A. DRESSELY'37 as section head, Technical Service Division, Humble Oil and Refining Company.

ROBERT B. GORDON'39 as project engineer, Sheldon Nuclear Facility, Atomic International Division, North American Aviation, Inc. . . . JOHN B. DWYER'40 as manager, Design Engineering Department, M. W. Kellogg Company . . . FREDERICK M. MANN, JR.'40 as supervising architect, University of Washington.

J. HARRY ORPEN'40 as regional sales manager, Bell Helicopter Corporation . . . DONALD W. ROSS'40 as national director, Society of Chartered Property and Casualty Underwriters . . . JOHN E. FLIPSE'42 as chairman, Research Committee, Newport News Shipbuilding and Drydock Company.

FRANCIS M. STASZESKY'42 as second vice-president and chairman of the finance committee, Engineering Societies of New England . . . JAMES P. BROWN'45 as manager of west coast operations, Grand Rapids Division, Lear Inc. . . . WILLIAM C. WITTMANN, JR.'45 as manager, Transcription Service Division, Prudential Insurance Company.

JOHN A. GUNNARSON'46 as acting assistant to the president, M B Manufacturing Company, New Haven, Conn. . . . CLAUDE W. BRENNER'47 as chief project engineer, Aeronautical and Mechanical Division, Allied Research Associates, Inc. . . . ARTHUR W. GALUSHA'47 as manager of electro-mechanical sales, General Electric Company, Burlington, Vt.

ROBERT E. SAVAGE'47 in charge of Distributor sales section, Nickel Department, International Nickel Company . . . DANIEL J. FINK'48 as chief engineer, Aeronautical and Mechanical Division, Allied Research Associates, Inc. . . . DONALD M. GRAHAM'48 as planning administrator, City Planning Board, Providence, R.I.

GEORGE G. HOBERG'48 as manager of special data processing equipment engineering, Radio Corporation of America . . . EARL D. HOYT'48 as regional manager, Lamson Corporation, Cleveland, Ohio . . . ROGER P. JEANTY'48 as vice-president, Pyrites Company, Inc.

HOWARD N. SMITH, JR.'48 as assistant to the president, New England Confectionary Company . . . BRUCE G. HOOD'51 as a director, Davidson Rubber Company, Charlestown, Mass.

## Pages from Periodicals . . .

"Research Builds America's Future," page 147, the October *Atlantic Monthly*, by RAYMOND STEVENS'17. The article discusses technical advances that have been made and new directions in which industry will develop in the future.

"Institute of the Aeronautical Sciences," an explanation of what the I.A.S. is and does, its foundation, aims, and accomplishments, the September *General Electric Review*, by S. PAUL JOHNSTON'21.

"The Current Business Insurance Scene," the May *Insurance Advocate*, by ROBERT J. LAWTHERS'21.

"We're Wasting Our Engineers," the May issue of *American Mercury*, by WILLIAM B. ELMER'22.

"Private Investment and Economic Development," article discussing the relationship of private investment to economic development abroad, the July issue of *Foreign Affairs*, by EMILIO G. COLLADO'31 and Jack F. Bennett.

"Inertial Guidance," article describing guidance without the use of radiation, by WALTER WRIGLEY'34, ROGER B. WOODBURY'48, and JOHN HOVORKA, all of the M.I.T. Instrumentation Laboratory; "Liquid Rocket Propellants: Is There an Energy Limit?" a discussion of the subject from a chemical point of view, by JOHN F. TORMEY'43; and "System Considerations in Instrument Dynamics" by VICTOR AZGAPETIAN'47, all in the October issue of the *Aeronautical Engineering Review*.

"What about Rare Earths for Ceramics?" in the August and September issues of *Ceramic Age*, by SIDNEY LEVINE'37.

"Future of American Foreign Aid," August *Scientific Monthly*, by Max F. Millikan, Center for International Studies.

## Obituary

JOSEPH L. GOODALE'89, November 5  
MRS. MARY LOWELL (COOLIDGE) BARTON'92, November 4

ALBERT P. MATHEWS'92, September 21°  
ARTHUR A. SHURCLIFF'94, November 12°  
GEORGE W. PRIEST'95, August 30°  
GERARD SWOPE'95, November 20  
HAROLD C. STEVENS'96, September 10°  
MRS. BENJAMIN F. LOW (MARY HARRIETT DAY)'99, August 29

MRS. ALPHEUS G. WOODMAN (MARION LOUISE CADE)'00, November 14

ROBERT V. BLAISDELL'02, May 27  
PAUL R. B. DICKSON'02, November 4  
JOHN M. EGAN, JR.'02, September 30  
MAURICE GOLDENBERG'02, June 11  
CHARLES E. MCCARTHY'02, November 6°  
JUSTIN E. HARLOW'03, October 9°  
EVERETT H. KING'03, November 20, 1956  
RALPH B. YERXA'03, October 4°  
LEONARD H. FOLEY'05, July 26°  
ALDEN MERRILL'05, November 24

JOHN R. TABOR'08, October 28, 1955°  
MRS. GUSTAVUS J. ESSELEN (HENRIETTA WILLARD LOCKE)'09, March, 1956

GUY N. HARCOURT'10, November 20  
PERLEY K. BROWN'11, November 16  
FRED R. CHURCHILL'11, January 8, 1956°  
CUTHBERT T. GREENLEAF'11, March 15°

CARL A. SCHAFER'11, September 22°  
JOHN C. WOODRUFF'11, September 6°  
BRYANT BANNISTER'12, May 15°  
JOHN BECKER, JR.'12, May 2°

CARL W. SOMERS'12, November 26  
WALTER H. J. TAYLOR'12, November 14  
JAMES A. TILLINGHAST'12, April 13°  
WILLIAM J. SLOAN'16, November 3

WILLIAM E. ADAMS'17, August 20°  
DUDLEY F. HOLDEN'17, September°  
HARRY R. MORRIS'17, February 13°  
HERMAN L. ROGERS'17, October 21°

WILLIAM C. HADDOCK, JR.'19, September 8, 1956

JAMES P. THURBER'19, October 19  
ROBERT T. KNAPP'20, November 7°  
R. B. DONWORTH'21, September 24°  
MEADE A. SPENCER'21, October 7°

JOHN N. DU VERNET'22, November 13  
JAMES E. KIERNAN'22, October 6°  
FRANK G. LOUD'22, Summer, 1957°  
RODMOND S. MAHAFFY'22, May 4

CHARLES M. PHELPS, JR.'24, November 18

OSCAR A. SAUNDERS'24, May 30, 1956°  
RAYMOND F. JOHNSTON'25, March 11°  
HOWARD F. SMITH'25, November 7

BOWMAN MCKENNAN'26, July 22°  
PAUL C. HITCHCOCK'27, August 29°  
EDWARD H. HAYES'31, Autumn, 1956  
WALTER W. VANBENTHUYSEN'31, April 28

JOSEPH L. THISTLE'32, October 26†  
RICHARD BERRY'40, October 27°  
JOHN L. MACKERRON'40, August 10°  
MRS. TRINELA B. E. (BEJARANO) CANE 2-'44, November 10

ALBERT W. VANNOSTRAND, JR.'56, November 23

°Further information in Class Notes  
†Further information in M.I.T. Club of Western Pennsylvania Notes.

# NEWS FROM THE CLUBS AND CLASSES

## CLUB NOTES

### Boston Luncheon

The M.I.T. Luncheon Club of Boston met Thursday, October 17, 1957, at 12:15 at the Union Oyster House. Almost 100 Alumni gathered to hear Richard S. Morse '33, president of the National Research Corporation, speak upon "Sputnik and Its Implications." Following graduation, Dick Morse did graduate study at the University of Munich. He organized the National Research Corporation in 1940; and since that time the business has progressed to a \$9,000,000 volume including that of subsidiary companies with \$3,500,000 devoted to research. Sales of National Research, subsidiaries, affiliates, and licensees now exceed \$100,000,000 per year. Their fields of research include investigation of rare metals, high vacuum and petro-chemicals. Dick is vice-chairman of the Army Scientific Advisory Panel. He brought out that the implications of the launching of Sputnik were much more of a political and military nature than scientific—by intention on the part of Russia. The efforts of Russia have been directed toward scientific and engineering accomplishments at the sacrifice of the welfare of the population; and therefore, tremendous strides in the education of scientists and engineers as well as in material gains in these fields are coming about.

In the U. S. we have our way of life and our scale of living which will not be permitted to suffer as an expense of scientific, engineering or military gain. In the accomplishment of a major research and development program such as guided missile, about 15 years elapse from the start of research to the end product. The expense for the first five years is minor, for the second five years about 65%, and about 33% for the final five year phase. In Washington, over the years there has been much overlapping research and development in the field of guided missiles because of failure to unify defense research and because security restrictions upon exchange of research information between these functions in the several arms of the military service strangle progress. One of the many problems associated with the development of a multi-stage missile is the thrust of power required to get it up through the stratosphere, project it through the ionosphere and the mesosphere, return it to the stratosphere, and accomplish its purpose, whether it be a mapping or surveying mission or striking a target. These problems involve aerodynamics, fuels and combustion, heat resistance and strengths of materials, electronics—fields which are so enormous that strongly directed organized research freed from jurisdictional bickering and unnecessary restrictions is vital. It is hoped that

Sputnik will stimulate a reawakening in this country. — PARKE D. APPEL '22, *Secretary-Treasurer*, Room 806, New England Telephone and Telegraph Co., 185 Franklin Street, Boston, Mass.

### Cincinnati

The M.I.T. Club of Cincinnati held a stag dinner meeting on October 23, 1957. Mr. Robert R. Weatherall, assistant to the Dean of Students, discussed, in a very entertaining manner, the differences between student life at Tech and at universities in Great Britain. Those who braved Asian flu and inclement weather to attend the meeting thoroughly enjoyed themselves. Those who attended were: C. Axelrod '48, R. Baird '57, J. Berlove '53, J. Comer '48, J. Cochrane, Jr., '23, S. Crew '34, F. Iskra '48, G. Michel, Jr., '53, J. Morgenthau '51, S. Rowe '43, J. Ryan '35, L. Michelson '40, J. Raffety '22, C. Seifert '48, W. Seinsheimer '36, L. Sjodahl '35, F. Spalding '22, S. Thorpe '52, E. Kruckemeyer '11, R. Dolle '21, M. Beyer, and W. Gailus.

The annual dues request was sent out and the response has been satisfactory so far. Dues, \$2.00 per year, should be sent to Mr. S. I. Crew, Crew Builder's Supply Company, 2120 Madison Avenue, Norwood 2, Ohio. Address changes for the mailing list should be sent to the Secretary. — JAMES S. STOLLEY '52, *Secretary*, 11 Beverly Drive, Hamilton, Ohio.

### Fairfield County

On October 29, the M.I.T. Club of Fairfield County held its fall dinner meeting at the Clam Box in Westport, Conn. John T. Rule '21, Dean of Students, who was to be guest speaker, unfortunately became ill and could not come. However, he very kindly arranged to have William Speer, Associate Dean for Student Counseling, represent him. Dean Speer proved to be a very able pinch hitter, scoring a hit with his interesting description of today's students at M.I.T. and his analysis of the underlying reasons for the attitudes and behavior characteristics they exhibit. Noting that since the war M.I.T. has become in large measure a residential college, he cited several examples to show the increased emphasis being placed on the quality of life outside of the classroom as an aid in student development. Referring to himself as the "listening dean," he related how the M.I.T. counseling system aims to help the student develop his full potentiality without relieving him of the responsibility to stand on his own two feet.

Among the Alumni present were: Donal Botway '49, William Cadogan '41, Samuel Cotter '24, Elmer Crouthers '55, Bailey Curran '29, Marc Cutler '39, Albion Doe '20, Phil Epifano '39, Alfred Gallucci '51, Randall Goff '51, Donald Gluck '56, Fred Green '32, Elmer Harmon '30, Raymond Hibbert '27, Vello Kampman '51, Norman Kreisman '48, Charles Lucke, Jr., '34,

Clarence Lyon '46, Grant Maple '49, Horst Orbanowski '31, Joseph Paul '13, Miles Pennybacker '23, Benjamin Ranan '47, Roy Roth '50, Anthony Savina '30, W. Ryland Scott '22, Philo Shelton '18, Clinton Springer '45, Lester Steffens '30, Oswald Stewart '39, Robert Swain '33, William Swift '29, Harold Tepper '52, Gordon Thomas '36, Lawrence Trowbridge '22, Arthur Weinberger '41, Bob Weppler '37, Richard Wiggins '47, Edwin Worden '31, and Abe Zimmer '39. In addition, Miss Laura Lamarre and Mr. Robert Read, counselors at the Norwalk High School; and Mr. Frederic Hawes, college adviser at the Stamford High School, attended.

President Bailey Curran appointed a nominating committee as follows to draw up a slate of officers for presentation at the next meeting: Clarence Lyon, chairman; Gilbert Mott '37; Elmer Crouthers.

Several from our club area were fortunate in being able to attend the Second Alumni Officers' Conference held at the Institute on September 6 and 7. Among those attending were: William J. Barrett '16, J. Edward Lynn '37, John E. Plantinga '45, Thomas E. Rounds '23, Anthony Savina '30, Clinton H. Springer '45, Oswald Stewart '39, Lawrence W. Trowbridge '22, and Edwin S. Worden '31. — ANTHONY R. SAVINA '30, *Secretary*, 79 Ledge Lane, Stamford, Conn.

### Lehigh Valley

The M.I.T. Club of the Lehigh Valley held its fall meeting at the Lehigh Valley (Shrine) Club in Allentown, Pa., on Friday, October 25, 1957. 22 members attended. After a social hour and a fine dinner, a brief meeting was held. It was decided that the Club would no longer continue to set up a scholarship fund of its own because the M.I.T. Alumni Fund is covering the matter of scholarships through all Alumni contributing to the Fund. Accordingly, the present balance in our scholarship fund will be donated to the M.I.T. Alumni Fund to be earmarked for Lehigh Valley scholarships.

After the meeting we were informed about Air Products, Inc., whence it came, where it is now, and what the future holds for this relatively new enterprise. One of its sales engineers gave a very interesting illustrated talk about this company, which makes liquefaction equipment, rectifying columns, and so forth, principally for the steel and chemical industries.

The evening was concluded with a tour of the plant, where we saw the fabrication of heat exchangers and the assembly of liquefaction and rectification equipment. — J. THEODORE ACKER '24, *Secretary*, 154 Langhorne Avenue, Bethlehem, Pa.

### Miami Valley

Although notices for the October 25 meeting at the Engineers Club, Dayton, Ohio, went out to 235 members, only 11



made reservations by return mail. To compound the erythema, only seven Alumni deigned to show their faces. For braving the elements, their names are listed as follows: Zach Abuza'41, Wallace Adams '21, Joe Bayer'39, Gene Bockhorst'46, Mike Gibbons'06, Otto Hardacre'36, and the undersigned. Before the evening was over, however, these few supported Robert K. Weatherall, assistant to the Dean of Students, so well that we all agreed the small size was just right for the occasion. The invited guests, 20 in number, were high school students from the surrounding area; and there were no facets of life at M.I.T. about which they asked no questions. Future Beavers and Alumni were all impressed tremendously with the wealth of background which Bob Weatherall has garnered in his single year at the Institute. The meeting gave the Alumni an opportunity to supplement Bob's presentation with reminiscences of student life, some hair-raising.

We are sorry to report the death of Harry B. Canby'02, on April 6, 1957. Recent change of address notices have been received from the following: A. R. Handelman'51, to 8813 Eager Road, St. Louis 17; B. T. Hastings'54, back to Boston; R. P. Hendrichs'56, to Saginaw, Mich.; F. J. Hooven'27, to 7 Lone Pine Court, Bloomfield Hills, Mich.; W. T. Hines'39, to Washington, D.C.; F. W. Penney'54, to Bedford, Mass.; and E. M. Rex'54, to 410 Colorado Boulevard, Denver, Colo.

Sunday, November 3, was the occasion of a tour of homes in the Dayton area in celebration of American Art Week. Of the nine homes honored for their excellence in taste in architecture and decor, one was that of Mr. and Mrs. George H. Mead'00.

The M.I.T. Club of the Miami Valley is planning meetings for December, March, and June to include a "coed" dinner, a plant trip, and a picnic. — Robert T. Olsen'42, *Secretary*, the Standard Register Co., Dayton 1, Ohio.

## New London

S. Curtis Powell'37 was guest speaker at this year's first dinner meeting of the M.I.T. Club on the Thames. Professor Powell, of the Naval Architecture and Marine Engineering Department, is no stranger to M.I.T. Alumni in this area; Alumni know him both from undergraduate days and through his consulting work at Electric Boat.

Professor Powell's subject, "I Want to Shoot Father," concerned parental responsibilities in preparing their children for a scientific or an engineering education. He stressed particularly the need for parents to take an active interest in the local school system and the need for engineers and scientists to make better known their profession to high school students. He also reviewed the Russian program for training scientists and engineers, underlining the importance attached to these professions in Russia.

A good turnout of Alumni and wives met in the cocktail lounge of the Gam Restaurant at Ocean Beach for a buffet supper preceding the talk. Russell W. Brown'42 of Niantic, last year's vice-president, was elected President, replacing

A. I. McKee'21 of New London. William G. Atkinson'49 of Groton was elected Vice-president, and Kent Moore'50 of Groton was elected Secretary-Treasurer, replacing George J. Seifert'51. — KENT MOORE'50, *Secretary-Treasurer*, Toll Gate Road, Groton, Conn.

## New York

This past fall season has been active for the M.I.T. Club of New York. The new quarters in the Hotel Biltmore have proved so successful that an average of 40 Alumni lunch each day at the Club. Our energetic Utilization Committee chairman, Ed Edgar'35, has scheduled class luncheons each month for each class. Reports from those attending have been most enthusiastic. Why not join your group next month?

A series of informal technical dinners has been organized at which attendance is limited. Those wishing to attend should get their reservations in early. "Color Television" was the subject of the first meeting. The next technical dinner, entitled "Why Can't We Adapt an Engineering Approach to the Problems of Biology and Medicine?" was held on November 14. Dr. Irwin W. Sizer, head of the M.I.T. Department of Biology, led the discussion, with John H. Teeter'22, Executive Director of the Damon Runyon Memorial Fund, acting as special chairman.

On Monday, November 18, the Club honored George Dandrow'22, recipient of this year's annual Silver Stein Award. Dr. Julius A. Stratton'23, acting president of M.I.T., was the principal speaker.

All Alumni are welcome at the Club. For those living in the New York vicinity the Club has much to offer, and for the out-of-towners the Club is ideal as a base of operations. — ROGER G. BLUM'41, *Secretary*, 11 Robin Hill Road, Scarsdale, N.Y.

## Oklahoma

The fall meeting of the M.I.T. Club of Oklahoma was held at the Petroleum Club of Tulsa on November 4, 1957. At this meeting, Mr. W. J. Sherry'21, a member of the Corporation, presented the 1957 Bronze Beaver Award to the Club in recognition of the outstanding regional conference held in Tulsa on February 2, 1957. Mr. Robert K. Weatherall, assistant to the Dean of Students at M.I.T., gave his impressions of the Institute in an interesting talk entitled "An Englishman Looks at M.I.T." The following officers were elected for 1957-1958 and took office immediately: President, Scott W. Walker'40; Vice-presidents, Breene M. Kerr'51 and John G. Burke'38; Secretary-Treasurer, Siegfried Penner'45; Executive Committee members, Paul A. Lobo'50, John P. Dowds'51, and Walter S. Smith'30.

The following M.I.T. Alumni were present for the meeting: John G. Burke'38, John P. Dowds'51, Willard A. Emery'21, Arman F. Frederickson'47, Clifton G. Frye'47, Bernard E. Groenewold'25, John W. Hawkins'48, Donal K. Holway'47, William R. Holway'15, Karol L. Hujak'47, Louise Jordan'31, Breene M. Kerr'51, Jack Larks'52, Paul A. Lobo'50, Van B. Luong'56G, Lyman W. Morgan'48, Rich-

ard Mungen'47, Frank G. Pearce'46, Siegfried E. Penner'45, Robert L. Rorschach'43, Robert K. Schumacher'45, William H. Shenkle'51, William J. Sherry'21, Daniel Silverman'29, Walter S. Smith'30, Samuel C. Stephan, Jr.'50, Shao E. Tung'50, Scott W. Walker'40, and John H. Wetzel'51. — SIEGFRIED E. PENNER'45, *Secretary-Treasurer*, 2511½ S. Boston Place, Tulsa.

## Philadelphia

Members and guests of the M.I.T. Club of Philadelphia, 134 of them, enjoyed our fall meeting at the Franklin Institute on October 28. The meeting was preceded by a social hour and dinner in the handsome marble halls of the Institute. Harry A. Kuljian, Class of '19, delivered an excellent after-dinner speech on "An Engineer Looks at Foreign Aid." Speaking from considerable world-wide experience as president of the Kuljian Corporation, he presented a stimulating view on how it would be to the advantage of our country to use our free enterprise system in more effective ways in developing backward countries throughout the world. He pointed out that the most serious problem in the present system of foreign aid is the fact that we encourage socialism in other countries by putting funds in the hands of local governments for them to stimulate industrial growth.

Membership returns for 1958 have shown some rather interesting facts about our members. We have people who are currently active in far-flung areas from Viet Nam to Greenland. A review of the positions of the membership in local industry shows that M.I.T. graduates hold a significant portion of the first-line management responsibilities in the area. Over one-third of our people have responsibilities which are described by titles such as manager, director, president, or chairman of the board.

The next meeting of our group will take place at the Barclay Hotel on Tuesday, January 28. A feature of the program will be an address by E. P. Brooks'17, Dean of the School of Industrial Management. He will talk to us about challenges to people in management, what they can do about their problems, and what M.I.T. is doing about them. — HERBERT R. MOODY, *Secretary*, 8609 Patton Road, Wyndmoor, Philadelphia 18, Pa.

## Rochester

At the second meeting of the Club, held on November 19, our members were treated to a fine talk by J. Lowen Shearer'50, professor in the Mechanical Engineering Department at the Institute. Professor Shearer's topic was "Current Developments in the Evolution of Engineering Education at M.I.T." Fred Kolb'38, Club President, has made the following committee chairman appointments: Phil Kron'34, Welcoming Committee; Mike Doyle'50, Program Committee; Robert Smith'33, president-elect of the Club and chairman of the regional personal solicitation program for the Alumni Fund, has appointed the following vice-chairmen: C. Buik'45, G. L. Calderwood'27, E. Edwards'37, A. S. Hamilton, Jr.'35, V. N. Hansford

'37, E. P. Kron'34, J. A. Rodgers'35, W. E. Summerhays'41, and D. E. Suter'38.

The first planning meeting was held in November with the inaugural session and start of the campaign set for February 5. Preliminary work by Fred Kolb and Chuck Buik has indicated that it would not be advisable to hold an Alumni regional conference in Rochester in the spring of 1958. It is planned to take appropriate action to set the proper climate for enthusiastic support of such a conference, possibly in the spring of 1959. It is the feeling of all active club members that such a conference at the right time could be very successful in Rochester. — JAMES K. LITZWITZ, *Secretary*, 191 Rogers Parkway, Rochester, N.Y.

## Western Pennsylvania

The board of governors of this Club met under the leadership of Tom Stephenson'45, our newly elected president, on July 25, 1957, and filled the following offices: Ingvald E. Madsen'33, Vice-president; Stuart D. Miller'32, Secretary; Elwood H. Koontz'36, Treasurer; George M. Colvill'51, Assistant Secretary; and William M. Laird'43 and Donald S. Fraser'28, Program cochairmen.

The 1957-1958 season started off with a meeting at the University Club in Pittsburgh on Wednesday, October 30, 1957, with Tom Stephenson'45, president, presiding.

The big event to which we were looking forward was the regional conference sponsored by this club and entitled "Science and Society — A Program for Progress." It was held December 7, 1957, in the Penn Sheraton Hotel in Pittsburgh. A most interesting and enlightening all day program was planned, climaxed at night by an address by Dr. Julius A. Stratton'23, Acting President of M.I.T.

Since our last meeting, this Club has lost Joe Thistle'32, for years one of its most ardent supporters. Joe died suddenly at his home in Eightyfour, Pa., on October 26, 1957. We will miss him greatly.

Following the business meeting, Bill Laird'43, introduced the speaker of the evening, Mr. E. H. Winterrowd, Special Agent in Charge for the Pittsburgh District of the F.B.I. Mr. Winterrowd gave us a most interesting talk on the inner working of his organization.

A total of 41 Alumni attended the meeting. — STUART D. MILLER'32, *Secretary*, 3043 Dwight Avenue, Pittsburgh 16, Pa. GEORGE M. COLVILL'51, *Assistant Secretary*, R.D. 1, Eightyfour, Pa.

## CLASS NOTES

### 1890

A few days ago George Packard telephoned me to tell me that, as they have done for several winters, George and Mrs. Packard are going to Florida for the winter. Consequently, until his return and until further notice, material for class notes should be sent to — CHARLES W. SHERMAN, *Assistant Secretary*, 16 Myrtle Street, Belmont 78, Mass.

### 1891

When Tech men get together . . . It was in late September on a broad piazza in Littleton, Mass. The delicious sunshine cast flecks of light, dancing with shadows, over every lawn, meadow, and tree. Children were at play on sidewalks and park; neighbors all around on this quiet country street. And there were two of us.

Quoth I: "What do you say, Harry, to making our next class meeting in June a regular banquet, a joyous family get-together? Your occupation has been in the deep-sea fishing line; boats for navigation in many waters, and as engineer you've had pretty marked success. Your avocation is ownership of a cranberry bog out on Cape Cod, and you have taken your daughter in as your partner in the enterprise. And there is our class president, Harry Young, still active manager of a great school supply firm — astounding, isn't it? He has a daughter, too, who is deeply engaged in the current publication field. I am a retired minister and have a daughter who is the proprietor of a business in New York City and is one of the members of the board of education in a community which is a suburb of New York.

"You see, we three are pushing 90 hard, and the girls, competent and active, are wearing 60, perhaps. But all six of us have experience, imagination, and a lot of gumption.

"Now, about the class party, will the rest of the boys stand for it? Daughters and all, I mean."

"Capital!" cried Harry. "These youngsters of ours would be the life of our reunion, and they'd keep the conversation on the cheerful, hopeful side. I'm for it!"

And with this he said, "Get a dish! I've a bushel of cranberries in the trunk of my car, berries I got from my own vines this morning."

You may be sure I did not hesitate nor delay. And such a sight! Red with sunlight still on them; crisp as ripe, cold watermelon: how cheerfully they rattled and spun in the metal container. "Yes," I said, "just the article to season the Christmas turkey." — W. CHANNING BROWN, *Secretary*, 15 Forest Avenue, Hastings-on-Hudson, N.Y.

### 1892

It is the Secretary's sad duty to report the death of another classmate, Dr. Albert P. Mathews at Woods Hole, Mass., on September 21. I am indebted to the *Worcester Telegram* for the following account of his career.

"Dr. Albert P. Mathews, 85, prominent scientist and trustee emeritus of the Marine Biological Laboratory at Woods Hole, Mass., died at his home yesterday after a long illness. Dr. Mathews was a professor of physiology and biochemistry. He was a graduate of the Massachusetts Institute of Technology and the University of Cincinnati. He later taught at these schools and at Harvard and Tufts College. He leaves his widow, the former Jessie Glyde, and a daughter, Mrs. Lewis R. Koler of Schenectady, N.Y." — CHARLES E. FULLER, *Secretary*, P. O. Box 144, Wellesley 81, Mass.

### 1894

Once more the Secretary regretfully reports that the Class has lost by death one of its distinguished members, the noted landscape architect and town planner, Arthur A. Shurcliff, who died at his home on Mount Vernon Street, Boston, on November 12. To the members of the Class he was known as Shurtleff; but in 1930, after some researches in England, he decided to have the name changed to that of his forebears, and it was legally changed to that given above.

Shurcliff was a well-known member of the Class in the Course in Mechanical Engineering and took his S.B. degree with us in 1894. He then studied for two years at Harvard in the then new field of landscape architecture, and took another S.B. degree there in 1896. Thereafter he helped in the founding of the Harvard School of Landscape Architecture and also entered upon the practice of this profession, in which he had a long and brilliant career. He served twice as president of the American Society of Landscape Architects, and was an honorary member of the American Institute of Architects.

For at least ten years after graduation he was associated with the famous firm of Olmstead Brothers, the most noted landscapists of that period; while with them he was also an instructor in landscape architecture at Harvard. Later he established his own professional firm, and at the time of his death he was senior partner of Shurcliff, Shurcliff and Merrill, with one of his sons, Sidney, as one of the junior partners.

One of his outstanding works was the recreation of the grounds setting at Williamsburg, Va., when the restoration of that historic town was undertaken by Mr. Rockefeller; he was associated with the work there for several years. Among his works in the Boston area were the design of the Storrow Memorial Embankment in 1930 and its redesign when the Storrow Memorial Drive was constructed in 1946. He also assisted in the development of Old Sturbridge Village, and was the designer of campus plans for many New England college and school grounds, among them St. Paul's, Groton, and Brooks schools, and the college campuses at Amherst and Mt. Holyoke, and at Brown, Tufts, and Colgate universities. He was also active in city planning, both in New England and in other parts of the country, especially in the South. Among the more than 50 private places he designed, Castle Hill at Ipswich is especially noteworthy; but there were many others, chiefly on Cape Cod, on Long Island and in Connecticut. For many years he was a consultant to the Boston Park Department and the Metropolitan District Commission.

We of the Class will remember him most pleasantly as a good companion and warm friend, and as the class poet at our graduation; we are proud of the distinction he had won in his long and useful career, which was terminated only by his demise at the age of 87.

It is a satisfaction to add the following items, drawn from the appreciative notice in the *Boston Herald* of the day following his death, and which show the breadth of his interests: "He was an enthusiastic

skier and mountain climber and for many years landscape adviser to the Franconia and Crawford Notch Commissions in New Hampshire. He also helped in the preservation and development of other scenic areas, including Barkhamsted and Quabbin Reservoirs in Massachusetts and Saville Dam at Hartford, Conn.

"He made his summer home in Ipswich and was a member of the Signet Society of Harvard and the Tavern Club. He was author of the first and second *New England Journals* and a number of magazine articles.

"He leaves his wife, the former Margaret Homer Nichols [M.I.T.'03]; six children, Sidney N., William A., John P., Alice W., Mrs. Sarah S. Ingelfinger, Mrs. Elizabeth S. Lowell; and nine grandchildren. A memorial service was held in King's Chapel on Friday, November 22, at 3:30 P.M." — SAMUEL C. PRESCOTT, *Secretary*, Room 16-317, M.I.T., Cambridge 39, Mass.

## 1895

The Review Office received a letter about the time these notes were due from Mrs. Luther K. Yoder, saying that the Class Secretary was in the Burbank Hospital in Fitchburg, Mass., following an operation on a fractured hip on November 2. The Review editors substitute for him.

A large picture in the *Buffalo Evening News*, October 23, shows Class President Alfred P. Sloan, Jr., receiving the Frank H. Lahey memorial award at a dinner in his honor the previous evening. Beside Mr. Sloan stands President Eisenhower, who addressed the meeting at which the award was given to Mr. Sloan for "distinguished service by a layman to medical education." President Eisenhower, speaking on the value of our private enterprise economy and the need for private effort to support medical schools and research, repeated a question Mr. Sloan had put to him during dinner: "Why are people so pessimistic about our economy, the greatest thing man has produced?"

George W. Priest passed away on August 30, 1957. He took work in Course V at M.I.T. after receiving his A.B. degree from Harvard in 1892. He had worked with Greiss-Pfleger Tanning Co. in Waukegan, Ill. His most recent address was 37 Town Hill, New Hartford, Conn. — LUTHER K. YODER, *Secretary*, 69 Pleasant Street, Ayer, Mass.

## 1896

"Happy New Year!" is the earnest wish to all classmates from the Secretaries. Most likely all members want to know how Dr. John is doing in his retirement; I talked with him on the phone this bleak November day and received this message: "I am getting along pretty well despite my 85 years. I have difficulty in walking, but I eat and sleep well and recently went out for a short drive. I've been thinking of starting a round robin letter and having everyone add to it." If you receive such a letter, hasten to add your bit and continue it on its way. While waiting for the round robin, it would be well if you delinquents would heed the Secretary's request to write him about your doings.

Mr. B. Williscroft writes a brief resumé of Joel Pillsbury's activities, saying he is well. The letter is particularly interesting when telling about Joel's experiences during the early days of pioneering in Prince Rupert: "In 1906 Pillsbury moved to British Columbia to work for the Grand Trunk Pacific Railway Company in establishing the townsite of Prince Rupert, which was to be the Pacific terminal of the transcontinental railway. Here he laid out the town, planned the streets, put in water and sewerage systems, and named a number of geographical points; for example, Mount Hayes after the president of the railway and Mount Morse after the vice-president. Later, when the Dominion Government survey party came to the area, they named Pillsbury Point and Pillsbury Cove for J. H. himself. Subsequently, the railway built a shipbuilding plant and floating drydock, for which Mr. Pillsbury supervised first the construction and then the operation for several years.

"Still later, with two associates, he bought the Pacific Stevedoring Co., with which he was connected until 1934; at that time he moved to Vancouver, B.C., to become one of the commissioners of the Workmen's Compensation Board. He filled this position for 10 years but retired in 1944 after the loss of his wife. Mr. Pillsbury has one son, a professor at the University of British Columbia, and four daughters, all of whom are married. One of his daughters is the wife of Dr. Hugh Keenleyside, Canada's representative on the United Nations in New York." We certainly are indebted to Mr. Williscroft for this letter and hope he will induce Mr. Pillsbury to send an account of the early days in Prince Rupert.

Harold C. Stevens died September 10, 1957; he formerly lived on Lake Avenue, Saint James, N.Y. His work was mostly in New York as an hydraulic engineer specializing in municipal water supply. Stevens and his wife had been living in Sanbornton, N.H., and were getting ready to leave for Florida when he was suddenly taken ill. He did not respond to treatment at home and was taken to the Franklin Hospital, where he died. He leaves his wife, Pearl Stevens, P. O. Box 123, Glen Head, Long Island, N.Y.; his daughter, Mrs. Alice Cannon of Tilton, N.H.; and five grandchildren; also his sister, Mrs. Lillian Burpee of Lakeport, N.H., and his brother, Louis Stevens of Pittsfield, N.H. — JAMES M. DRISCOLL, *Secretary*, 129 Walnut Street, Brookline 46, Mass. HENRY R. HEDGE, *Assistant Secretary*, 105 Rockwood Street, Brookline 46, Mass.

## 1897

In October George R. Wadleigh wrote us as follows regarding our classmate Arthur S. De Wolf, who died February 19, 1957: "Some time ago I promised you some notes on De Wolf. I am sorry to say they are brief. De Wolf and I became acquainted at high school in Charlestown, Mass., where in our military drill he was top sergeant in the company; I was a private. He was an excellent soldier, taking the drill seriously. At the end of the normal three year course I lost track of him until entering Tech a year later.

"At Tech, Course II, he was a hard-

working student and excellent draftsman. He lived at home, I believe, in Charlestown. He was a good, serious companion but not much of a mixer. He graduated with the crowd, ending up with Locomotive Option.

"I think that he adhered to railroad work most of his life. He came to no reunions until the 50th at Osterville, where he did not greatly enjoy himself. I think that it was my urging that got him there. De Wolf had changed little in the 50 years since I had last seen him, keeping his slender build and again mixing little.

"At the conclusion of the reunion I drove him to Boston; and on that ride I learned that he never married and was living with a sister in Melrose, where he had lived almost continually for many years, though he spoke briefly of some year's work in New Jersey. He told me little of engineering activities, having largely given that up in favor of financial work, where he reported considerable success.

"He was not very enthusiastic about the reunion and did not expect to attend another. He was a rather liberal contributor to one or more of our fund raising efforts and spoke of possibly leaving some of his estate to M.I.T. A fine fellow but very hard to know."

George Wadleigh is still in active business and maintains an office at 500 Fifth Avenue, New York, as consulting engineer in the pulp and paper industry. We are sure that all the members of our Class are now fully aware of the fact that George does more than anyone else to keep alive our interest in class affairs and our far-flung survivors. He is our active and successful class agent for the M.I.T. Alumni Fund. Early in September he attended the conference at M.I.T. for class agents and secretaries and afterward wrote as reported below. I, personally, was unable to attend the conference, much to my regret.

"Before occurrences get rusty, just a few lines to tell you that you missed a most interesting and instructive time by not being present the past several days at the conference. All arrangements were well carried out; and the food and accommodations, as well as the weather, were excellent. Tech distances are so great that had it been rainy there would have been some discomfort. Many old friends were seen and, I hope, new ones made. I encountered one of '91 and it was reported that there was another of that vintage, as well as '96; other than those, I was the antiquarian of the bunch. About 350 were present.

"Most of the speakers were good; one or two should practice with a tape recorder. No doubt as secretary you'll get a full printed report, or it will appear in *The Review*."

We still have amongst our survivors enthusiastic long-distance motorists. After our 60th reunion Tom Weymouth wrote as follows: "Since seeing you I drove from here (Bemus Point, N.Y.) to New York, picked up Charles Dunn in Lock Haven and took him with me for about four days in my apartment in New York City. Then I drove him back and came alone from Lock Haven to Bemus. Grand weather and a fine drive."



Bill Binley was enthusiastic about the snapshot in color of our 60th and wrote as follows: "Many thanks for the picture of the reunion group. It was most interesting and greatly appreciated. I have thanked Jere and told him I would like to get an enlargement for framing. I don't suppose we can count on many more as good as this; and I thank you for getting the group together for such a fine time."

Gus Lamb also wrote: "Yours of August 13 with the fine picture of our 60th reunion was awaiting me on my return from a short vacation. I am delighted to have this memento of a very enjoyable occasion. I have written Jere to thank him for remembering me although not in the photo. See you next June? Nice write-up of Irénée du Pont in the recent number of *Life*."

Gilbert Pratt not only sent a note of appreciation but spread his enthusiasm around Gloucester to such an extent that a notice appeared in the Gloucester *Times* on June 13. Gilbert wrote: "Thanks a lot for sending me the picture of the 60th reunion that 'Mrs. Jere' took. I am writing them. I surely enjoyed the get-together we had. It was good to see the old gang again."

The newspaper item read as follows: "Gilbert H. Pratt of Nashua Avenue had a pleasant experience the first of this week, when he attended his 60th reunion as a graduate of Massachusetts Institute of Technology. On Monday, Mr. Pratt attended the Alumni luncheon, which was held out of doors on the lawn at M.I.T. Tables were reserved for all the members of the classes graduating 50 years or more ago. Consequently, Mr. Pratt had a reserved seat for the occasion. He had a delightful midday visit with his friends, 11 of whom were from his own Class, some 60 years ago."

"Tuesday the celebrations continued, and Mr. Pratt journeyed to Dedham, where he enjoyed a class get-together at the Endicott House. 13 of the Class congregated for this pleasant luncheon, and Mr. Pratt reports that they had a really wonderful time reminiscing about the good old days back in 1897."

Everyone doubtless received the appeal for the Alumni Fund from George Wadleigh, our class agent. To such a worthy cause we are sure you will give generously. — JOHN P. ILSLEY, *Secretary*, 26 Columbine Road, Milton 87, Mass.

## 1898

Your Secretary found himself very busy as chairman of the Ladies' Committee, a sub-committee of the convention of the American Association of Textile Chemists and Colorists which was held in Boston in the middle of November. The program, which he helped plan and carry out, included trips around Boston, M.I.T., Harvard, and a tea for the ladies at the Gardner Museum. Because of the Convention, your Secretary was unable to prepare class notes, which were due at the same time. He apologizes and promises to bring his classmates up to date next month in the February issue of the *Technology Review*. — EDWARD S. CHAPIN, *Secretary*, The Eliot, 370 Commonwealth Avenue, Boston 15, Mass.

Bassett Jones is carrying on a vigorous campaign for an increase in salaries of professors and instructors in technological institutes, particularly Stevens Institute, which was his Alma Mater before he came to M.I.T. He takes the stand that teachers are more important than buildings and monuments.

George H. Priest, now living in Oklawaha, Fla., lost all his household goods when his house burnt down recently. This story I heard in a roundabout way. Perhaps George will furnish further details when he reads this item. George formerly lived in Brattleboro, Vt.

Harry Keith White, IV, seems to be "renewing his youth like the eagle," for he has recently returned from a long trip abroad that few of us would undertake at our age. But let him speak for himself: "I crossed on the S. S. *United States* in September, my itinerary taking me again to Paris; then on to Switzerland, Rome, Athens; back to Rome, Nice, the Riviera; and finally to Portugal, where I returned from Lisbon by plane nonstop to Idlewild. A most satisfying trip.

"When in Athens I of course looked up my old friend, Gorham Stevens '98, whom I had not seen in many years. We both, as you may not know, were fortunate in spending our early years after graduation in the office of McKim, Mead, and White when Charles F. McKim and Stanford White were living; Stevens worked under McKim and I under the junior member of the firm. Those were the days when truly beautiful buildings were erected. So you see, Stevens and I, over the years, have had much in common.

"I found him in excellent health at home one afternoon where we had an opportunity to reminisce and discuss architecture, both ancient and modern. On both we are fully in accord. His home in the heart of Athens is delightful and I can quite understand his reluctance to undertake another trip to America.

"One of his recent accomplishments is the creation of a beautiful plaster model of the Acropolis as it existed in the Golden Age of Pericles, the model measuring approximately four by seven feet. Owing to his familiarity and outstanding knowledge of all the structures erected on the Acropolis, it is an authentic reproduction of that marvelous area dominated by the magnificent Parthenon.

"This model is to be seen in the recently restored Stoa, the ancient market place of Athens. Its excellence is attested by the fact that the Metropolitan Museum of Art here in New York has, I understand, asked G. P. to create a duplicate for its own exhibition purposes. This I think he intends to do."

Harry has not retired, and says he has no intention of doing so. — BURT R. RICKARDS, *Secretary*, 349 West Emerson Street, Melrose 76, Mass. MILES S. RICHMOND, *Assistant Secretary*, South of Commons, Little Compton, R. I.

## 1900

Having received no class information recently, we are quoting herein from some notes which, although somewhat stale,

may be of interest. Jim Patch wrote last spring: "Mrs. Patch and I spent about three months, January to April 10, in California. We started in the desert region of the Southland, near Palm Springs, visiting relatives who live in that region at La Quinta. As spring weather progressed we moved northward by auto along the California coast until, by the end of March, we found ourselves at the home of Captain E. L. Patch '10, U. S. Navy Retired, at Vallejo, across the bay from San Francisco. Captain Patch is one of four Patch brothers who hold M.I.T. degrees. The trip proved to be a happy reunion with relatives and friends, some of the friendships dating back over 50 years to high school days or life in Lebanon, where I went directly after graduating from Tech. Incidentally, we visited many of the spots which have made California so attractive as a vacationland and, to an increasing number, as a place to live. I should add that the possibility of making the trip came as a surprise Christmas present from my children."

Charles Leeds wrote on May 27, 1957, from Pasadena: "I am temporarily housed at home as the result of a severe fall which produced a broken shoulder and severe shock. Am recovering in good shape, however. I regret extremely that arthritis is sneaking up on me to such an extent that it will be impossible for Mrs. Leeds and myself to attend the class reunion at Coituit. Please give my most cordial good wishes to all who remember me. There may not be many, for I left M.I.T. in April, 1899, to enter West Point. My later service in the regular Army, as an officer in the Corps of Engineers, afforded some very interesting experiences, some among hostile Moros in Mindanao, too lengthy to describe here. Was placed on the retired list in 1912 for physical disability incurred in line of duty, and have lived and practiced (as a consulting civil engineer) ever since. Many friends tell me I should retire from practice and loaf. Perhaps. But I am serving as consultant on too many interesting and important public projects which I hope to see through to fruition, to quit now. Here are a few of them: (1) Tech adviser to International Boundary Commission (U. S. and Mexico); (2) designer of coastal steam power plant for San Diego Gas and Electric Co., Southern California Edison Co., Los Angeles Department of Water and Power; (3) consulting seacoast engineer for State of California (involving title to coastal oil-bearing tide- and submerged lands). Assuring continuance of the family tree, Mrs. L. and I have four children and 14 grandchildren. One of the latter is slated to enter Williams College next fall for three years, to be followed by two years at M.I.T." — ELBERT G. ALLEN, *Secretary*, 11 Richfield Road, West Newton, Mass.

## 1901

This month I shall clear up the remainder of the class replies sent me last spring. The news is old but some of you may enjoy reading it. There will be no Review notes in February as the Class Letter goes out then. If you want any future notes you will have to send me more material.

I give you word from Ed Church written last February. He says: "As I have made no change in my place and method of living, I have no news that would be of interest to class members. Some deaths in family members but fortunately none in the group of close relatives. I am able to keep good health. As to future reunions, I hope to be able to attend a 60th reunion if one is arranged, but would probably not attend any in other years between now and then. The suggestion of a dinner 'in or near Cambridge' in 1961 is certainly simple and the work of preparation for it would be less than for a two-day affair. Some might say that it would not be worth while to go so far just for the class dinner, but I would look on it as much more than that, as having considerable significance. The number of class members who could or would attend in years after 1961 would grow smaller very rapidly and perhaps that year would be the last organized gathering of any substantial number of representatives of the Class of 1901."

Allen McDaniel, IV, of Waterford, Va., writes: "Some four years ago I retired from active practice and largely from participation in civic affairs, although I continued to serve on the county Board of Zoning Appeals until this winter. I was one of the original members of the Board and had served continuously for about 14 years. My wife Margaret and I went to our usual winter home in Florida at Oakwood near Crescent City early last February. Soon after our arrival there I had a mild heart attack similar to that of President Eisenhower — and had to spend 17 days in the hospital at De Land, followed by a month of rest at our cottage at Oakwood. We came home about three weeks ago (April) and I am still convalescing here. Our good physician predicts that I will be back to normal in about another month's time. My principal ambition is to get about again with our faithful Buick. We are hoping to be able to get up to New England this fall to visit some of our relatives. Perhaps we can crown our trip with a visit to Boston and at least get a glimpse of our beloved Alma Mater on the Basin. Please extend my warmest regards and all good wishes to the members of the Class."

Charlie Tufts, X, from New York, writing to me says: "No wonder you get discouraged at times but don't let it get you down. I'll bet the men get more fun from your notes than they'll ever tell you. Some of us have reached the point where nothing much happens from January to December but we always hope the other fellow has done something exciting. All I can report is the usual winter escape to the Southwest. Tucson was cooler and wetter than we have ever seen it; but as an offset the desert was greener. Folks were beginning to hope that the long and disastrous drought might be about to break." — THEODORE H. TAFT, *Secretary*, Box 124, Jaffrey, N. H. WILLARD W. DOW, *Assistant Secretary*, 78 Elm Street, Cohasset, Mass.

## 1902

Shortly after our reunion I received from McKechnie a page from the *Carlsbad Current-Argus* which carries an ex-

cellent picture of himself and his grandson and describes McKechnie's pursuit of botany as a hobby. Being retired, he has busied himself collecting many flowers and plants in the surrounding country. To be better informed he has taken a course in botany at Carlsbad Community College and built up a library on the flora of New Mexico and Arizona. At present he has collected, preserved, and catalogued some 500 specimens for his herbarium. He is also interested in photography, and his color photographs of cactus and his black and white photos of the blooming yucca have appeared from time to time in the *Journal of the Cactus and Succulent Society of America*. A reproduction of one of the yucca pictures appears in the article received from McKechnie, and it is quite understandable that the original picture is superb.

A clipping from the *Boston Globe* gives news of the death of Charles E. McCarthy, Course X, on November 6, 1957, in the Lederman Army Hospital, San Francisco. He and Mrs. McCarthy were in a severe auto accident two years ago, and it is probable that the injuries received then contributed to the cause of his death. Although he had been living in Marysville, Calif., since the accident, Las Vegas, Nev., had been his home since 1905. He was a native of Haverhill, Mass.

He started his career as a fire insurance inspector here in the East but went to Las Vegas in 1905 where, in Mac's own words, he did "all sorts of engineering and metallurgical work in private practice, on my own or with various associates, until war came in 1917." He then entered the Officers' Training Camp at the Presidio in San Francisco and was commissioned a captain. He was later assigned to command Company 1, 13th Infantry of the Eighth Division. He was promoted to major in 1918 and began duty with the General Corps at Washington. Later he served at various posts in the United States, Hawaii, Panama, and the Philippines. After 28 years in the Army, he retired in 1945 with the rank of colonel. He was decorated in 1944 by the War Department for "exceptionally meritorious conduct in the performance of outstanding service as officer in charge of all matters pertaining to the organized reserve, National Guard, enlisted reserve corps, and Army specialized training program within the military district of Washington."

McCarthy was very active in the civic life of Las Vegas in those years before and after his Army career; he headed Civil Defense until his accident. He leaves his wife, Mary E. McCarthy; a daughter, Mrs. Wendell Humphrey of Marysville, Calif.; a brother, Joseph F. of Haverhill, Mass.; and two sisters, Mary A. McCarthy of Cambridge, Mass., and Cecelia A. McCarthy of Tarrytown, N.Y.

According to the *Engineering News-Record*, Farley Gannett has retired as president of the firm of Gannett, Fleming, Corddry, and Carpenter of Harrisburg, Pa., but remains as chairman of the board. The firm, founded by Farley, engages in practically all branches of civil engineering and has a staff of over 500. It is "one of the largest and best in the country, with a record of high professional achievement," to quote the *News-Record*.

The Massachusetts General Hospital has set aside the entire fourth floor of a new building which has just been completed as a center for neurological research and, at its dedication in October, christened it the Mixer Laboratories. Our classmates Jason and Charles Mixer were long connected with the Hospital, as was their father, Dr. Samuel J. Mixer '75, before them. Jason before retirement was chief of the Hospital's neurosurgical service, and Charles was chief surgeon in the Children's Hospital. — BURTON G. PHILBRICK, *Secretary*, 18 Ocean Avenue, Salem Mass.

## 1903

As the New Year begins, our 55th since graduation, a good resolution to make would be to send in at once some item of interest about yourself in the Golden Age Period. If you are interested in what your classmates are doing, they will be equally interested in your experiences. Your contributions are the chief source of material for class notes.

Your Secretary was pleased to be able to attend the recent Alumni Council Meeting, a stimulating occasion, with our class representative Ike Atwood. Information is desired concerning Francis D. Kehew, III, whose last address was Transvaal, South Africa, and Walter A. Smith, IV, whose last address was Greenfield, Mass. Both are now assumed deceased.

Howard S. Morse, I, advises that a new Operations Center of the Indianapolis Water Co., of which he is chairman of the board, has been opened at 1220 Speedway Avenue, Indianapolis, Ind. He would welcome a visit from old acquaintances.

Ralph B. Yerxa, III, aged 76, North Meadow Street, Richmond, Va., died on October 4, 1957. He was born in Cambridge, the son of the late Edward N. and Mrs. Georgiana Yerxa, and educated at Cambridge Manual Training School and M.I.T., where he received a degree in mining engineering. For many years he was associated with the Miami Copper Co., Globe, Ariz., and later was a consulting mining engineer in New York City. He moved to Richmond in 1951. Surviving are his wife, Mrs. Elise Wilmer Yerxa of Richmond; two sisters, Mrs. William Fisher Saul of Duxbury, Mass., and Mrs. Horace Baker of Pennington, N.J.; and several nieces and nephews. He was always much interested in class affairs and will be greatly missed.

Justin E. Harlow, XIII, R.F.D. 2, Webster, Wis., died on October 9, 1957. The sympathy of the Class is extended to Mrs. Margaret H. (Nichols) Shurcliff in the recent death of her husband, Arthur A. Shurcliff '94. — LEROY B. GOULD, *Secretary*, 36 Oxford Road, Newton Centre 59, Mass. F. A. EUSTIS, *Treasurer*, 131 State Street, Boston 9, Mass.

## 1904

There is much in the daily papers about the epidemic of Asiatic Flu but nothing about the wave of writer's cramp which must be very prevalent, for it has sorely afflicted the class of 1904. No communications of any kind reached us in time for inclusion in the present batch of notes.



Your two volunteer editors report bouts with physical infirmities. Gene was hit by acute pyelitis which required a week in the hospital to overcome. He is now (November 12) well on the mend and makes brief trips to his office. Carle had an attack of shingles on the face which made him uncomfortable and marred his natural beauty for a time, but did not send him to bed. Sorry there isn't more current news to report; but in lieu of this, we are sure you will be interested in some additional facts regarding a late classmate.

Last spring these notes recorded the passing of Paul Paine and a brief statement was made regarding him. Our attention has recently been called to a tribute to Paul in the July *Bulletin of the American Association of Petroleum Geologists* written by Ernest K. Parks. It is too long to give in full but some quotations are as follows.

"Born in Baltimore on August 26, 1881, Paul Paine was reared in rugged New England atmosphere. He attended school at Peacham, Vt., and his frequent reference to that town led to his nickname 'Peacham' which followed him through college days at M.I.T., class of 1904. A Revolutionary ancestor was killed at the battle of Bunker Hill. Paul Paine gave the distinguished lecture series of Petroleum Geologists in 1949-50 on his favorite subject, 'Oil Property Valuation,' which title is also that of his famous volume. No other book has approached it in scope and authority. One of his early activities was a series of lectures at his Alma Mater, M.I.T., in 1920. The next year Paul embarked on an historic assignment making a brilliant entrance into the consulting field with the Percy Rockefeller interests. This connection led to his election as director and member of the executive committee of Union Oil Company of California. Later, Paul was chosen to make a complete appraisal of all the properties of the Union Oil of Delaware and participated in arranging a merger with the Royal Dutch Shell group. He was active in the new company and served a year as vice-president in charge of production. In his own behalf Paul searched out a structure in the Midwest-Sunset field and with three other men formed the Formax Oil Company in June, 1922. It continues its modest but prosperous existence to this day.

"Paul's other love was Kern County Land Company, tremendous farming, cattle and oil royalty corporation of California. He served this company as consultant, director, and member of the executive committee from 1938 to his retirement in 1954.

"Paul Paine lived up to the tradition of his pioneer forebears. His life was strict, stern and strenuous; yet he was considerate, kind and helpful. His advice was sought by top executives of the largest oil companies. All who had the privilege of his counsel valued it most highly and were the better for it. Paul will live in the hearts of his friends as a unique personality. His humor, his quaint stories, his narratives about early incidents in the oil fields have entertained us time and again; all to some point. His firm stands had a foundation of unimpeachable honor, and he expected the same character in others. He was a relentless foe of any compromise with

truth. He demanded revealing facts and full disclosure in any investigation. There will never be another Paul Paine."

The above remarks about Paul may remind some of you of the remarks President Pritchett made when he first addressed us as freshmen. He emphasized in the strongest terms the necessity for absolute honesty in an engineer. Nothing less should be tolerated by the public, whom we were preparing to serve. It was therefore the policy of the Institute authorities to deal severely with students who were found to be dishonest, to the end that M.I.T. graduates would be dependable. — GENE RUSSELL, *Treasurer*, 82 Devonshire Street, Boston, Mass. CARLE R. HAYWARD, *President*, Room 35-304, M.I.T., Cambridge, Mass.

## 1905

Browsing through some ancient '05 history recently I ran across a notice regarding a midwinter class dinner in 1908. This amused me: "The matter of the Class Baby has not been satisfactorily settled as yet. The qualifications are that this honor be bestowed on the first boy born to a member of the Class who was married after graduation. A technicality such as being married one day before the sixth of June, 1905, will bar; twins or other mitigating circumstances do not count. Let us take a Baby Census at this time, and fill out the blanks relating to this on the enclosed post card with care." I continued reading but could not find the result. Was it Jim Barnes' boy? A penciled note I found in the archives intimated that Jim was disqualified because he was married before graduation. How about it, Jim? Some of you Florida travelers might try digging Jim out. His last address is 10811 S. W. 92nd Avenue, Miami 43, Fla.

Bob McLean, II, recently returned from Alaska, where he visited his son. He intended to contact a few '05 men on the Pacific Coast on his return, but an attack of flu in Alaska caused him to return home direct. Like all modest go-getters, Bob wonders whether he has done a good job as class agent. His records over the years should answer that doubt. You're re-elected, Bob. But he needs the active co-operation of 100 per cent of the Class; so does the Institute. Incidentally, speaking of contributions from '05 men, we note from the last report of the Alumni Fund a gift of \$8,550.00 from the Albert C. Gilbert estate. Bert Johnson has just had a ravishing experience. His first grandchild, Bertrand L. Johnson, 3rd, was born on September 20, 1957. Bertrand, Jr., is working as an electrical aid in the Nyal Laboratory in Washington, D.C., and finishing his electrical engineering course at George Washington University, after having graduated from Montgomery Junior College (Silver Spring) and taken three years at Bucknell. Bert (#1) has recently had published by the Bureau of Mines his report on "Potassium Bearing Mineral Resources of Oceans." Finally, but happily not final, Bert had a hospital checkup of a malignancy which hospitalized him nearly two years ago. Result O. K.

Doc Lewis, holder of the Priestley

Award in chemistry (and many others), was selected for the American Petroleum Institute's 1957 Gold Medal recently. Andy Fisher sends a contribution to our column of Wit and Humor. The joke is on Doc Lewis and a visit to his doctor, but Andy adds that no one but Harrington, Folsom and Crowell would understand it, so we'll send it to them and save space. Here's a better one. Bobby Burns writes that he has spent the entire summer vacation as a nursemaid to a garden, carrying water in a bucket after dark to his flower garden. Roy Lovejoy, too. Explanation: a severe drought in and around Boston caused severe water restrictions.

Bobby and Mrs. Burns, by the way, left here about December 10 for Daytona Beach for the winter. Another '05 man wintering in Florida is Ed Poor, VI, who is already at his winter home, 709 Idlewyld Drive, Fort Lauderdale. George Fuller, I, will be at 14751 Lincoln Drive, Leisure City, Homestead, Fla.

At the October meeting of the M.I.T. Boston Luncheon Club, I saw Babcock, Buff, Fisher, and Helpert, who brought his son, a Harvard man, in good company. At the daily M.I.T. table at Thompson's Spa I have dined occasionally with Hadley and Loughlin. Walter Eichler, II, called at my office recently to tell me that he had taken up permanent residence at Harwichport (his summer home for many years); he admitted that he is still unmarried. You will remember that Fred Poole has for many years been an ardent bird watcher. A couple of months ago he announced that he was "migrating south with the birds." Now comes his announcement of his marriage on October 22 to Dorothy Stock Law Dow. Please, no wisecracks. Honestly, Fred, we do hope for years of happiness for you and your bride. The newlyweds are living at 17 North Girard Street, Woodbury, N.J.

Leonard Cronkhite presided over the first Atomic Energy Day Program held at M.I.T. on November 9. So you can understand this atomic question in laymen's language, I quote from a newspaper article: "If you're interested in knowing something about atomic energy but can't understand the scientists' jarg — pardon, technical terminology — have a talk with Leonard W. Cronkhite of Cambridge.

"Translating atomic science into laymen's language is both a necessity and a mission for the 74-year-old Cronkhite, who is vice-president of Baird-Atomic, Inc., Cambridge instrument firm, and chairman of Massachusetts' first Atomic Energy Day, to be observed next Saturday at M.I.T. As a businessman, Cronkhite needs man-in-the-street terms to describe to potential customers what makes his company's instruments tick. (And quite a few of them do tick.)

"As a man not educated primarily in the sciences, Cronkhite, a former Rhodes scholar, is well aware of the linguistic gap between scientists and laymen, and feels it must be bridged as much as possible. That is the why of the forthcoming Atomic Energy Day program, he says. We cannot exploit the peaceful uses of the atom to their fullest unless we have broad public understanding and support of scientific investigations in this field. The program will include six concurrent afternoon panel



discussions on peaceful uses of the atom and an evening program featuring Governor Furcolo, Dr. Vannevar Bush, and Dr. Walter G. Whitman, head of the M.I.T. Chemical Engineering Department.

"When Cronkhite talks of atomic energy, he uses such familiar terms as 'cousin' and 'building blocks.' You have to think of each of the normal elements—copper, zinc, etc.—as a family of cousins. These cousins are particles of matter known as isotopes. One (or more) of them may be radioactive, in which case it is called a radioisotope. A radioisotope of a given family (element) is like the other members of the family, but not identical. Unlike his cousins, he is not stable. He is not content to stay home, but insists on emitting little bursts of energy, as if to strike out on his own. These bursts are called radiation.

"To understand why he is not exactly like his cousins, but still a member of the family, you have to think of this isotope as being made up of building blocks. The isotopes of a given element—zinc, for example—have a certain number of blocks of matter in their core, or nucleus, and a certain number of tinier blocks called electrons circling around this core, like satellites. The lighter elements have fewer core blocks and fewer electrons revolving around those cores. The heavier elements—for example, uranium—have heavier cores and many more electrons buzzing around them. Now when man tampers with these groups of cousins by bombarding them with thin streams of particles of matter, moving at furious speed, he may knock one or more electrons away from isotopes. This cousin may then be, but isn't necessarily, a radioisotope, an unstable member of the family.

"Radioisotopes have many peaceful uses, and promise to have many more. In medicine, for example, radioisotopes have been used in locating tumors, malfunctions of the thyroid, and so forth. They have also been used to treat certain thyroid conditions, and some cancers. There are numerous industrial uses, including a radioactive band worn on the hand of the operator of a machine press. If the man's hand is in the way when the press starts to come together, it will stop when the radioactivity is recorded by the mechanism, thus keeping the hand from being crushed."

We learn of the death of Leonard H. Foley, II, at Natick, Mass., on July 26, 1957. Len's last position, I believe, was as a sales manager for W. D. Cashion Co., South Boston. He retired a few years ago.—FRED W. GOLDTHWAIT, *Secretary*, 274 Franklin Street, Boston 10, Mass. GILBERT S. TOWER, *Assistant Secretary*, 35 North Main Street, Cohasset, Mass.

## 1906

We hope your Christmas was a happy one, perhaps even a merry one. And was one of your New Year's Resolutions a solemn cross-your-heart promise to send in a newsy letter for these notes? Last June a postcard arrived with a picture of that palatial cruiser, the *Stella Polaris*, and a message from Harold Coes from the North Cape. Early in August came a long

letter after Harold and Agnes had returned from what he called a wonderful tour. They sailed May 16 on the *Mauretania* for Southampton; thence to Bournemouth where Agnes had cousins; were in London for a week—Agnes wanted to see the new Queen, as she had seen every reigning monarch in England since Victoria—and of course saw the whole royal family at a trooping of the colors. Then to Harwich to board the *Stella* for the ship tour of two weeks up the long coast of Norway to the North Cape, the most scenic and interesting water trip they had ever taken, even surpassing the inland passage to Skagway, Alaska. Harold says he never realized there were so many islands off that coast—said to be 140,000 and he thought they must have passed 100,000 of them! Weather was bad at the North Cape so they had to anchor at another harbor and go by auto; they couldn't see a thing because of rain, sleet and fog. On that cruise they debarked for eight shore excursions; to see a glacier they drove for several miles between walls of ice and snow more than twice as high as the car. On another trip they were up in the Lapp country, saw how the Lapps live with their herds of reindeer, and crossed over the boundary into Sweden.

Returning to Harwich, they crossed by night boat to the Hook of Holland, thence went by train to Cologne and Coblenz, and by day boat up the Rhine—a beautiful trip, but hot, seeing mountains, vineyards, castles, and quaint towns. At Wiesbaden a guide-driver with a modern Cadillac car met them for a two-week tour through Germany, Austria, and Switzerland. Harold says the highlights of that trip were Baden-Baden and Rothenburg, an old walled town on a hill and interesting because of the architecture of its ancient buildings. Munich, he says, was a total loss as far as they were concerned: They could go only a few blocks without seeing evidences of bombing, despite all the new construction—the city must have taken a terrible plastering. From Salzburg they drove to Berchtesgaden (Hitler's hideout), which they found to be a perfectly beautiful place. Austria, Harold thought, was one of the most beautiful countries he had ever been in; hotels were good, likewise the food, "except I did get tired of veal." Harold raved about Switzerland, too. He visited Saint-Moritz with its grand views of the snow-capped mountains and the green lake below; then went to Zurich where they make watches; to Paris by train; to Le Havre; and took the *Mauretania* home. They sure covered some ground, but Harold didn't say whether they took any pictures or movies for us to see at the next reunion.

You might not think so but Harold evidently uses a crystal ball! Way back in 1932 I clipped a newspaper account of the annual meeting of the American Society of Mechanical Engineers when he was a Veep and was quoted as saying: "It is conceivable that airplanes might extend their radius and mobility almost as much over the automobile as the auto did over the horse and buggy. We could then visualize ourselves living on a farm or in an agricultural community 100 miles from our office and require no more, perhaps less, time to commute than we now take."

When you consider the thousands of planes that are privately or company owned today, that was some vision for 25 years ago. Also ponder, in these days of Sputnik, guided missiles, the DEW line, SAGE, and so forth, what Harold said to the 1956 graduates at that luncheon: "It is dangerous to prophesy, but there is one prediction which can be made with certainty, and that is, when the class of '56 meets here in 2006 to celebrate their 50th, they too will be authorities upon technical devices which are not even dreamed of today."

A clipping has recently come from the Alumni Office about Dr. Simeon Carlyle Allen. He was born in Roxbury in 1885 and entered with us in 1902, graduating in Course V. Setting up in Rochester, N.Y., as a consulting chemist, he joined the American Fruit Products Co. as a consultant in biochemical research and also became Secretary-Treasurer of the Maplewood Distilling Co. He remained in Rochester until 1923, when he made a momentous decision. He moved back to Roxbury and applied for admission to Harvard Medical School. They turned him down "because he was too old at 38 to undertake such a venture." Nothing daunted, he became more determined than ever to enter medicine and applied to Tufts Medical. There he was told he lacked the necessary background in biology; but he convinced Dr. Rushmore, Tufts dean, that his scientific knowledge of physics and chemistry should outweigh any deficiency in biology, and started at Tufts that fall. After completing his four years he went to Vienna in 1928 to do post-graduate work in neurology and psychiatry. It was there he met his present wife, Rose, and they were married a year later. Returning to Boston he started his practice in psychiatry and in 1938 was retained by General Electric as a medical consultant: "They found I had studied under the late Dr. Wagner von Jauregg, the only psychiatrist ever to win a Nobel Prize." He is a consultant for various insurance firms and for many years has been doing research in geriatrics. He says his objective is to turn back the clock for senior citizens by slowing the rate of aging. That perhaps is why he has been for a number of years director of research, Health Research Foundation in Boston, Mass.

Dr. Allen has a married daughter, Mrs. Audrey A. Vose of Pinehurst, by his first wife and he and the present Mrs. Allen have a son, Robert J., who works as an assistant public relations consultant at Tracerlab.

Some of you who attended the graduation exercises at our 50th may have talked with Dr. and Mrs. Allen then. His career is another typical example of how difficult it is, after getting through Tech, to predict where you'll end up; but wherever destiny has taken us, most of us have had a rewarding, satisfying, and useful career. That's an opening for me to suggest, why not send me a more or less detailed account of yours. Happily, no deaths or address changes to report, though by the time this Review is in the mail some of you will be back in Florida.—E. B. ROWE, *Secretary*, 11 Cushing Road, Wellesley Hills 81, Mass.

On Friday evening, November 8, 1957, twelve '07 men, together with our guest of the evening, sat around a table in a private dining room at the M.I.T. Faculty Club in Cambridge and partook of roast prime rib of beef or lobster thermidor, as desired — excellent dinners — and at the same time enjoyed the real warmth of good fellowship that is possible only among a group of men who have known one another for more than 50 years. Your Secretary gave greetings and information regarding a few classmates who were unable to be present. Phil Walker passed around snapshots that he took of classmates during our 50 year reunion, and also showed fine colored moving pictures taken during that same event or at the Institute on last June's Commencement Day or Alumni Day. Then I introduced our guest, Joseph J. Snyder '44, vice-president and treasurer of M.I.T., suggesting that while the dignity and responsibility of his office might call for our addressing him as "Mr. Snyder," the combined facts that he was born in October of 1907, after we had already completed our undergraduate days at Tech, and that he was really a member of the family of '07 due to his having handled in his office the contributions made by our classmates to our 50 Year Gift Fund for M.I.T., made it appropriate for us to call him "Joe." We might compromise on "Mr. Joe." It quickly became apparent that "Joe" was adopted, to the satisfaction of all.

Joe told us in his delightful, informal, and friendly manner about some of the developments in the physical plant and in personnel at Tech, and about some of the problems of various kinds that were currently taking place there. Then, with the aid of some charts, he gave us an illuminating talk about the handling of Tech's investments. When I say that no one went to sleep while he was talking, you'll know that he must have been interesting! The following men attended this fine meeting: Dick Ashenden, George Crane, Paul Cummings, Bill Egan, Tom Gould, Milton MacGregor, Harry Moody, Bryant Nichols, Bob Rand, Gilbert Small, Phil Walker, Stanley Wires. Joe Snyder told us that our 50 Year Gift to the Institute was included by the M.I.T. Alumni Fund Board in the sum of \$200,000 which was appropriated from the record-breaking 1957 Alumni Fund to be applied to the \$5,000,000 being sought to use for increasing faculty salaries. As our gift was \$65,694.42, and as Mr. Alfred P. Sloan, Jr., '95, is matching every three dollars secured by something over one dollar, this means that '07 is responsible for about \$90,000 being added to this special faculty salary fund.

A pleasant incident that took place during our dinner on November 8 was due to the sharp eyes of Joe Snyder, who chanced to see W. A. Hokanson, the M.I.T. Bursar, walk past the open door to our private dining room. Quick action on the part of Joe resulted in his escorting the bursar to the doorway, and introducing him to our fellows. We were all happy to greet the man to whom checks for our 50 Year Gift Fund were made payable.

Joe Snyder told us that Clarence Howe is now chancellor of Dalhousie University

in Nova Scotia and spends two days out of each week there. A clipping from the *Wall Street Journal* of October 14, 1957, stated that Clarence had been elected a director of National Trust Company, Ltd., with head office in Toronto, Canada. I sent an announcement of our November 8 dinner to Clarence, and he wrote to me saying that he was to be in western Canada on that date. His address was still 7 Crescent Road, Rockcliffe Park, Ottawa, Canada, but he expected to move to Montreal later.

In the early part of last November I wrote just a breezy, friendly, personal letter to our classmate, Edbert C. Wilson, in Waterville, Maine; and under date of November 7 I received a gracious acknowledging note from his wife. She said that Edbert was not able to write himself on account of his very poor health. He does enjoy reading, to some extent, and will welcome letters from '07 men. — BRYANT NICHOLS, *President and Secretary*, 23 Leland Road, Whitinsville, Mass. PHILIP B. WALKER, *Assistant Secretary and Treasurer*, 18 Summit Street, Whitinsville, Mass.

## 1908

The first dinner meeting of the 1957-58 season was held at the M.I.T. Faculty Club, Cambridge, on Wednesday, November 6, 1957, at 6:00 P.M. Bunny Ames, Bill Booth, Nick Carter, Myron Davis, Les Ellis, George Freethy, Sam Hatch, and Joe Wattles answered the roll call. We were favored with two guests: Mrs. George Freethy and Sam Hatch, Jr. After a proper sojourn in the Cocktail Lounge, we moved into Private Dining Room One for the usual bountiful dinner and comments of doings during the summer and news of other classmates. It was decided that at future dinner meetings the ladies would be invited.

After dinner Joe Wattles showed some very fine Kodachromes taken last spring on his way to attend the Rotary International Meeting at Lucerne, Switzerland. Joe and Mrs. Wattles visited the famous and well-known spots in Italy, Germany, France, and Switzerland. Joe also showed snaps of our 49th at Harwichport, also of our 35th and 45th. He showed some very fine Kodachromes taken by Bill Booth, showing construction of a new ski run in the White Mountains and beautiful autumn foliage.

Harold Osborne spent some time last summer in Russia. His comments will be of interest: "As you requested, I am glad to send you a few comments regarding the interesting trip which Mrs. Osborne and I had this summer, including a visit in Russia.

"We went first to Paris for one week, where I was a delegate at the International Management Conference. From there we flew by way of Copenhagen and Riga to Moscow to attend meetings of the International Electrotechnical Commission, an organization in which I have been active for a number of years. We were in Russia 15 days. One week end we flew down to the large hydroelectric station on the Dneiper River at Zaporozhye. Before leaving Russia, we visited Leningrad, and from there flew to Helsinki.

"About 300 foreigners from 25 countries attended the meetings in Moscow. As was to be expected, the Russians were very friendly and co-operative and provided extensive and interesting entertainment. We felt entirely free to come and go as we wished and to take photographs wherever we wished. Our communication with others, however, was greatly hampered by the fact that we spoke practically no Russian and found very few Russians who could speak either English or French. Our contact with them was almost wholly through interpreters.

"The delegates were shown a number of electrical installations and manufacturing plants. We found the Russians were doing advanced technical work. For example, they are operating an electrical transmission line from Kuibyshev to Moscow, about 600 miles at 400,000 volts. There is no higher electrical transmission voltage in the world.

"We noted great economic differences between the condition of the bosses and of the workers. By European or American standards, the workers' economic status is very poor. The people with whom we talked showed great national pride but indicated little or no interest in other countries. This was not the experience of everyone and may be due, in part at least, to the fact that we were dealing through interpreters. The comments or questions which came to us regarding our country showed great misinformation. Particularly, the Russians believed that the status of the working man in this country is very bad.

"We came away with the belief that visits of foreigners in Russia (if they went in a friendly spirit) and visits of Russians in other countries could be a very important influence in the long term toward the maintenance of peace. If enough people cross the Iron Curtain in both directions, and particularly Russians coming to other countries, it must tend to reduce greatly the present misunderstandings between the people of Russia and of the western European and American countries."

Colonel Charles McHenry Steese and Mrs. Charles Morgan Salter were married on September 20, 1957, at Carlisle, Pa. They will make their home in Harrison, Ark.

We are sorry to report the death of John Rodney Tabor at his home in Houston, Texas, on October 28, 1955. The sympathy of the Class has been sent to his family.

Have you made your gift to the Alumni Fund? If not, please do so soon. Remember, your gift helps to build up our 50th Year Gift to the Institute — so, be generous.

We plan to hold our 50th reunion at Snow Inn, Harwichport, on the Cape, June 13-15, 1958. Make your plans to be with us. H. A. S. N.? — H. LESTON CARTER, *Secretary*, 14 Roslyn Road, Waban 68, Mass. LESLIE B. ELLIS, *Treasurer and Assistant Secretary*, 230 Melrose Street, Melrose 76, Mass.

## 1911

An even dozen Eleveners, gathered at our annual "Seven Come '11" class dinner on the evening of November 7, recessed



just before 8:00 P.M. to hear President Eisenhower's "Science and National Security" address and were thrilled, as all of you must have been, at his announcement that our beloved M.I.T. President, Jim Killian, was his appointee as Special Assistant to the President on Science and Technology. An admirable choice; the announcement was not a complete surprise, since Senator Flanders of Vermont had suggested such a move a few days earlier.

Following custom we had prefaced our talk-around by the reading of the names of 12 classmates who had died in the preceding 12 months, and all stood in silent tribute to their memory. Roy MacPherson, II, of Framingham, was first to report in the clockwise talk-around. In addition to his teaching in the field of meteorology, Roy said he was busy on a number of non income-producing activities; and at Dennie's insistence he gave us some details of his prize-winning time estimating sailing trip, which won for him a fathometer, as noted in the December class notes. He said his present status might be called a "domestic engineer."

Obie Clark, II, of Weymouth, said he was in the midst of selling his successful and profitable business — Nelson Cement Stone Co., Inc. — and has agreed to stay with the company on a part-time basis for a year starting last September 1. If he continues to feel as at present, he said, he'd like, upon retirement, to sleep 22 hours and eat the other two each day. Last March, instead of Alma's and his taking a proposed Florida trip, he was taken to South Shore Hospital, Quincy, for an unpleasant but highly successful operation. He was glad also to report that his wife, Alma, was much better after a serious early summer illness. He still maintains interest as a director of the Quincy Co-operative Bank.

Henry DOLLIVER, I, of Belmont, retired, said he'd have to accept Roy's domestic engineer appellation. He, too, had an operation in March and has since suffered from bursitis, from which he is still a bit rocky. Roger Loud, VI, of Weymouth retired from Boston Edison four years ago; and although their sons are now married and raising fine families, he and his wife are still living in the 11-room family home. They flew to Minneapolis last spring to visit their older son, Warren, M.I.T. 1942, who is an associate professor of mathematics at the University of Minnesota. Warren has mastered the Russian language and is doing well for himself translating mathematics books at \$7 a page, while also finishing a math book for a fellow professor who died recently. Alden, M.I.T. 1949, is now with the Detroit Cancer Research Center in the Motor City.

Charlie Linehan, I, of Cambridge, is now retired and claimed also to be a domestic engineer. He still is much interested in football, which he spent so much time coaching over the years. The Linehans' daughter is now teaching in West Medford. His side-kick, Art Leary, XI, of West Roxbury, retired a year ago as a mathematics teacher in the Boston public schools, but now has returned to math teaching at the Newman Preparatory School, Marlboro Street, Boston. This is a school largely for service men, with a

year-round program embracing about 500 day and 300 night students. He said that with the advance of electronics and the atomic theory, of necessity mathematics needed today is greatly different from that of our day. In fact, since World War II math has changed perceptibly. Some industrial concerns, like General Electric, are already holding seminars for secondary school math teachers, with most of the expense borne by the fostering company. M.I.T., Dartmouth, and other colleges are inaugurating summer courses for secondary school math teachers. Art's talk led to a lively discussion all around the table, to the delight and education of all.

Jack Herlihy, II, of Medford, like Loud an Edison retiree, reported that he and Mabel had just been blessed with their 10th grandchild — a record for all present. He is continuing an active interest in the Medford Hospital as a member of the board of directors; his particular interest is in building additions and new equipment, and thus he also might qualify as a domestic engineer.

Morris Omansky, V, of Brookline, reported that he had recently had a fine renewal of acquaintance with C. R. Johnson, X, of Wyckoff, N.J., at a meeting of the 25 Year Club of the Rubber Industry in New York. C. R. and his son are doing a fine business under the firm name of Spencer Products Company, making good use of several patents C. R. holds in formulae for tire mixes. As for himself, Morris said he was busier than ever testifying in chemical phases of the rubber industry; like Art Leary with math, Morris started a lively discussion when he stated that tubeless tires are still far from perfect.

Marshall Comstock, VI, of West Medford reported a new grandson, Stewart M. Smith, born July 10, giving Helen and him three grandsons and four granddaughters. They spent five months this summer at their place in Cushing, Maine, and had a particularly successful vegetable garden, much to their own and their friends' and neighbors' delight. They had visits from Harry and Grace Tisdale, V, and Joe and Rose Harrington, VI.

John Alter, IV, of North Andover and Lawrence, says he is keeping up a lively interest in the Boston Architectural Center as an active member of its education committee. He is also doing architectural consulting work and drawing plans now and then. He is also doing some work on developing welded forms to replace cast iron. From an educational standpoint, he said he decried the increasing tendency of many scholarship winners to take the easiest courses leading to a college degree, rather than the course they should take to best develop their own latent talent.

Carl Richmond, I, of Winchester, brought the regrets of his close companion, O. W. Stewart, I, of Kingston, who had fully intended to be present but a couple of weeks ago had contracted influenza, which led to a severe case of pneumonia, from which he is now slowly but surely recovering. Carl said that his oldest boy has recently been transferred from the M.I.T. Lincoln Laboratory to Santa Maria, Calif., along with nearly 700 other scientists. His second boy, in the U.S. Air Force, is now a jet pilot and at present on maneuvers on the Sahara Desert. He told

us of the fantastic rates of speed his boy and other jet pilots had attained — for instance they flew from mid-England to Tripoli in three hours. He said that he himself is enjoying retirement and never realized there was so much work to do around a home — where he is assistant housekeeping engineer. He is secretary of the Red Cross Chapter in Winchester and has just completed a paper on "Stained Glass Windows" after five years' study.

That brought it around to yours truly, and it was a pleasure to report that all members of the family, including eight grandchildren, are in good health, and that Sara's shoulder separation is coming nearer and nearer to near normal again.

President Don Stevens, II, of Ridgewood, N.J., expressed his regret at not being able to be with us. He said he and Lois had come up to Northampton to get his mother for return to Ridgewood after spending the summer here in the Bay State. Ernest Batty, II, had hoped to attend but at the last minute had to go to Norwich, Conn., on a business trip for Lincoln Stores, which he serves. A trip to New York prevented Bill Coburn, I, from attending; and similarly, an extended business trip to Maine and New Hampshire kept Cal Eldred, VI, away. Maurice Lowenberg, VI, had a last minute intervention; and Gordon Wilkes, II, bemoaned the fact that East Orleans is so far from Cambridge, "especially at night." Suren (Bog) Stevens, IV, also was unable to attend, saying he is particularly busy right now on fire protection work in state institutions — currently at the Fall River and New Bedford Textile Institutes and the Medfield State Hospital — as an associate of C. J. D'Amato and Associates, Boston. President Carl Ell, XI, of Northeastern University wrote: "Things crowd in so that it seems impossible for me to keep a continuous contact with our Class of 1911. Please express my regrets and best regards to all."

Regretfully we have received word of the death of four classmates since the last class notes were written. Fred R. Churchill, II, died January 8, 1956; Cuthbert T. Greenleaf, II, on March 15; John C. Woodruff, X, on September 6; and Carl A. Schafer, XIII, on September 22.

Churchill, essentially a Harvard man who spent a short time with us, was a member of the Cambridge catering family — Churchill Caterers — well-known for years. We have no details except the date of his death reported to us by officers of the Boston Luncheon Club. Greenleaf prepared for M.I.T. at Stoneham High School and was a member of the Mechanical Engineering Society as an undergraduate. His wife notified the Alumni Office of his death, adding he was a Stone and Webster engineer for 35 years, retiring in 1953.

From his son, Dr. Whitney Woodruff, a surgeon with the East Bay Clinics, Virginia, Minn., we learned of Jack Woodruff's death after a prolonged illness: "The highlights of his career included the position of research director of Commercial Solvents Corp., Terre Haute, Ind., for many years until about 1936, and more recently as associate director of research and development for Merck Company, Inc., Rahway, N.J., until his retirement in 1952."



Born at Mackinac Island, Mich., Woodruff transferred to M.I.T. in our junior year after graduating from Williams College in 1909. He and Thorne Wheeler, X, of Chatham, N.Y., did their thesis together; and after graduation for a couple of years the two operated as the chemical engineering consulting firm of Wheeler and Woodruff. In 1913 Woodruff joined forces with the Southern Oil Company and in 1919 became a chemical engineer with Western Electric Company. He joined Commercial Solvents in 1925 and Merck and Company in 1936. Survivors are Dr. Woodruff and his older brother, John, of the Haley Corp., his wife having died in 1952.

Born in Nebraska City, Neb., Carl Schafer attended the University of Oregon before joining us in our junior year and receiving his S.B. in naval architecture. He was a naval architect with the Hog Island Shipyard before and during World War I, making his home in Camden, N.J., where he lived for the rest of his life. He had been associated with a number of other shipbuilding organizations, including the Philadelphia Navy Yard, the New York Shipbuilding Corporation, and the Mathis Shipbuilding Company, as well as serving as instructor at both Temple University and Drexel Institute of Technology. He received a master's degree from the University of Pennsylvania in 1928 and was a member of Franklin Institute and the Society of Naval Architects and Marine Engineers. His wife, Abigail E., and a daughter, Mrs. George E. Schwab of Camden, survive him.

He was a loyal and active member of the Class over the years and in a letter of appreciation of my letter of sympathy, Mrs. Schafer wrote: "Although he appreciated his Oregon and Pennsylvania affiliations, his love was always Tech. Did you ever know that we all three Schafers almost met you a very long time ago (1931), when we drove up to Douglas Hill one Sunday for dinner? You and your wife were away for the day and a Mr. Skilton [our office clerk] was most pleasant. Everything was fine except the roads and they were pretty awful."

An unfortunate incident in a football game between Brandeis University and Northeastern in late October led to the severance of athletic relations between the two universities, which led to the following statement by N. U. President Carl Ell, XI: "We have two men in charge of football — Mr. Gallagher, the athletic director, and Joe Zabalski, the coach. They are both gentlemen. Whatever they say controls our athletics." Carl's statement in regard to Jim Killian's appointment was most expressive: "President Eisenhower has made a fine choice in appointing Dr. Killian as special assistant to direct the missiles program. He is a most able organizer and educational administrator, and he will be a tower of strength to the President in this new drive to advance science and technology in the defense program."

Here's how the *New England Yachtsman* reported the log race referred to in last month's notes: "Largest event of its kind ever staged in New England waters, the District 12, U. S. Power Squadron, predicted log race saw 42 boats thrashing to the finish line at noon, Saturday, Sep-

tember 14. Winner of the Mondeo perpetual trophy, first place plaque, and a Raytheon Holsday fathometer was Roy G. MacPherson in his auxiliary *Comewa*. His percentage of error was 0.99, with second place going to K. Hartman in *Trident II*, with an error of 2.04." Good work, Roy!

In order to set forth both the firmly established principles and the empirically rooted practices of sound recording, to relate them to each other, and, where this is not yet possible, to delineate the remaining problems, a group of 15 lectures was inaugurated on consecutive Thursday evenings starting October 24 by the Audio Engineering Society at R.C.A. Institutes, Inc., 350 West 4th Street, New York City. Lecture 14 on February 6, from 7:15 to 8:15 P.M., will be by Richard H. Ranger, VIII. Dick will consider "the various media that have been used for audio multi-channel operation, such as film tracks, multiple disk recordings, electric music instruments, magnetic tape in its many forms, and now the two-channel single groove disk-recording."

Had a fine letter from Bill Warner, I, Nowata, Okla., accompanying his generous subscription to the current Alumni Fund (sent yours in yet?) and it was nice to hear he was feeling much better after a period of ill health, during which he had been "in and out of Barnes Hospital in St. Louis." Another "Fund" letter came from Harry Tisdale, V, advising that he and Grace had sold their house in Waterford, Conn., put their things in storage, and were leaving in mid-November for Florida, where they intend to live. Their initial address is P. O. Box 2655, Fort Meyers Beach, Fla. — just 15 miles south of Fort Meyers.

"Grace and I went up to Chamberlain, Maine in August," he wrote, "and spent a week with Rose and Joe Harrington, VI. We also went upstate to Cushing to say 'hello' to Helen and Marshall Comstock, VI, and returned via picturesque Gloucester and Rockport. If all goes well and we can still get around, we expect to be at Snow Inn in June, 1961, for our big 50th, but I'll sure miss the new January meetings. We're both feeling fine and anticipate not having to think of the water freezing up or having snow to shovel."

All of which brings to mind that we now have quite a 1911 colony in Florida and all of them undoubtedly would appreciate classmates and their wives looking them up when in the neighborhood. There are, in addition to the Tisdales: Hall Sargent, II, P. O. Box 3, Crescent City; Osborne H. Shenstone, I, 4 Harvard Drive, Lake Worth; Norman DeForest, III, P. O. Box 155, Maitland; George A. Cowee, III, R. D. 3, Box 665, Merritt Island; Harold A. Smith, II, N. E. 72nd Terrace, Miami 38; and Lewis L. Baxter, IV, 223 San Juan Drive, Ponte Vedra Beach.

These notes will appear just after the turn of the year, but here is a hearty Happy New Year to you all, and if you are in Manhattan on Tuesday, January 7, join us at the Architectural League of New York, 115 East 40th Street, for the annual "Welcome to Dennie" luncheon. — ORVILLE B. DENISON, *Secretary*, Chamber of Commerce, Framingham, Mass. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford 55, Mass.

## 1912

Fred Barker has served as president of the Syracuse Savings Bank for the past 12 years. He is also director of Pass and Seymour Company and of the Institutional Mutual Investment Fund. Fred and his wife winter in Florida and manage to travel quite a bit the rest of the year.

Harold Manning, a patent lawyer in Waterbury, Conn., has hobbies of golf and photography, as well as bowling, and is active in Boy Scout work. He has no intention of retiring, as life is too interesting.

John Raymond, a partner of Metcalf and Eddy, sanitary engineers, makes his home in Beverly and commutes every day.

Taylor Roberts is making his home in Chatham, Mass., on the Cape, and has recently suffered several light heart attacks. Albion Davis is now controller of the Algonquin Club in Boston and makes his home in Wellesley. He is very active in town affairs, having served on the Finance Committee and new school building committee.

We regret to report the death of Bryant Bannister, II, of Lake Lure, N.C., who passed away on May 15, 1957. John Becker, Jr., II, passed away on May 2, 1957, at his home, 1351 N. Orange Drive, Hollywood, Calif.

James A. Tillinghast passed away in Providence, R.I., in April. After leaving the Institute, Course VI, he received his degree at Harvard Law in 1916; he has practiced law since then in the family firm of Tillinghast, Collins, and, Tanner. He served as a trustee and vice-president of the Roger Williams Hospital and served on the staff of Governor Norman S. Case. An enthusiastic yachtsman, he took part in several Bermuda races and was a familiar figure at Naragansett Bay. He is survived by his wife and one daughter.

Charles M. d'Autremont writes from Hemet, Calif., Route 1, Box 318, that he is semi-retired after a life of prospecting and operating small mines in Montana, Arizona, New Mexico, and old Mexico. He writes: "Of course when I am told of a likely prospect I hot foot it to see what it is, always hoping that the next one will be The Bonanza, as it is never too late. Once a desert rat — always a desert rat." — FREDERICK J. SHEPARD, JR., *Secretary*, 31 Chestnut Street, Boston 8, Mass. C. BOLMER VAUGHAN, *Assistant Secretary*, 455 W. 34th Street, New York City.

## 1914

The latest Fourteener to send word of his retirement is George Perley, our former assistant secretary, who has been with the Edwards Company in New York as an applications engineer in the signal and fire alarm field, particularly for hospitals and schools. Although retired, George will continue as a sales and engineering consultant. George is the 1914 official representative of the M.I.T. Club of New York, and he calls our attention to the fact that 1914 has its particular meeting day on Wednesday of the first full week of each month. The M.I.T. Club is at the Hotel Biltmore adjacent to the Grand Central Station, and all Alumni are welcome whenever in New York City.

The 54th meeting of the Acoustical So-

ciety of America was held in October at the University of Michigan. A paper was presented by J. Warren Horton entitled "Evaluation of Surface Reverberation In Sonar." Horton is with the Navy Underwater Sound Laboratory at New London, Conn.

Bill McPherrin and his wife are doing what every '14 man dreams about after retirement—taking a two-year trip around the world. Currently they are traveling through the East visiting such places as Djibouti, Penang, Singapore, Bangkok; then it will be on to Hong Kong, followed by six weeks in Japan. The following letter from Bill, dated October 22 from Rotterdam, tells of his travels in Europe: "Today Mrs. McPherrin and I complete 14 months driving our own car through Europe; tomorrow we start home by ship via Japan and Australia. . . .

"On October 5, 1956, we drove on the Autobahn (super highway) from Hanover through Helmstedt to West Berlin and on Sunday the seventh East Berlin police welcomed our tour of their city much changed by bombs. The night of November 8 we heard the mob tear out the windows of a book store just around the corner from our hotel in Vienna. This was at the time Russia was crushing Hungary. This book store was suspected Communist. We saw Dachau, Hitler's murder factory. The real thing, not just propaganda.

"At Belgrade, Cyrillic alphabet store signs for business conduct irritated our provincialism. Our guide, furnished through the government-controlled Putnik Travel Agency, almost gasped "No" when I stopped our car to take a picture of Tito's residence.

"In Greece (first of December) the mountain ride from Thessalonike to Athens compared favorably with Switzerland; history and restoration by Rockefeller Foundation more than expected; climate (Athens and south) in winter wonderful; oranges surpass any others we found in Europe, if not in California.

"Istanbul has Robert College whose president since 1955 is a former Faculty member of M.I.T. Robert College, oldest American College outside the United States, has for 94 years lived in the main stream of Turkish history. It has survived wars, pestilence, and revolution. Thus as historian Arnold Toynbee once wrote, it has fulfilled 'one of the great educational needs of our time; its achievement has been to provide a home of learning, kept free from fierce political controversies of the present age, in which young men of all religions and all nationalities have been able to receive a first-rate modern education.' No attempt is made to Americanize its students. The outstanding work of this seventh president of Robert, Duncan Balantine, gives reasons to believe that the best years lie ahead. Incidentally, the cordiality of reception to me, as an Alumnus of M.I.T., and my wife made our Christmas season very cheering.

"Sicily is enjoyable. Taormina is outstanding even with presently erupting Aetna right outside your window. Tour of the island is equally pleasing. Syracuse drew a Greek colony about 700 B.C. Palermo is bursting with history.

"Italy and France are as advertised. A tour of the vast battlefield at Verdun and

men killed in two wars makes a sympathetic pause as you see a presently dazed and bewildered France. U. S. cemetery at Omaha Beach with its rows of glistening white marble crosses and Jewish Stars witnesses our price to help freedom.

"Spain is more than a little gaunt, but with James Reynolds' book *Fabulous Spain* and several historical guides our 36 days were very rewarding.

"In Morocco our tour was delightful. Tangier, Rabat, Casablanca, Marrakech, and Fez surprise and please. Maréchal Lyautey really served well there. Southern England lives up to its promises. Jim Reber suggested this little report, Regards and best wishes."—H. B. RICHMOND, Secretary, 100 Memorial Drive, Cambridge 42, Mass. HERMAN A. AFFEL, Assistant Secretary, 120 Woodland Avenue, Summit, N.J.

## 1916

To start off, we hear from Ralph Fletcher: "I am pleased to have this opportunity, at the invitation of our Secretary, to give a brief 'President's Message.' In recent months, the activity which has been carried on by our 50th Year Class Gift Committee has begun to bear fruit. This committee, consisting of Joe Barker, chairman; Bill Barrett, class agent; Steve Brophy; Harold Dodge; and Jim Evans, put a great deal of effort into the initial planning to be sure that the program would get off on the right foot. The wonderful results to date indicate that they are on the right track; and knowing their determination and devotion to this cause, we have every reason to be confident that our 50th Year Class Gift will be something of which we will all be justly proud. I can also announce that we are going ahead with our plans for our 42nd class reunion. The dates have been set—the week end of June 13, 14, 15, 1958, immediately preceding Alumni Day, which falls on Monday, June 16. In recent years, we have found the Chatham Bars Inn to be suited ideally for a group such as ours, so we have made our reservation with the Chatham Bars Inn for the 42nd reunion. Start planning now so that you will be with us on that week end. Believe me when I say that those who have been coming to these 'interim' reunions have really enjoyed themselves and look forward with enthusiasm from one to the next. Finally, as a brief personal note, I am happy to announce [as noted in the Nov.'57 issue; Ed.] that on June 6, 1957, my wife gave birth to our daughter, Rebecca Ann, the newest holder of the title, 'Class Baby.'"

Dr. Raymond Blakney and Mrs. Blakney sailed on August 7 on the S. S. *Olympia* for Piraeus, Greece. Reason? A highly significant one. He is president-elect of Orinda Childs Pierce College for Girls at Elleniko, Athens, Greece, as stated in a release from the Boston Office of Communication of Congregational Christian Churches. Pierce College, which has a faculty of 50 Greeks and Americans and a student body of 550, was founded by the American Board of Commissioners for Foreign Missions in 1923. As a Course I man, Dr. Blakney has had an unusual and distinguished career. He was president of Olivet College in Olivet, Mich., from 1949

until last June. He began his overseas career in 1920 as an educator in Foochow, China, where for seven years he was professor of mathematical physics in Fukien Christian University. Returning to the U. S. in 1927, he served as pastor of North Parish Congregational Church, Sanford, Maine, from 1928 to 1934; and of First Congregational Church, Williamstown, Mass., from 1934 to 1943. He was awarded a D.D. degree by Williams College in 1941. From 1943 to 1946 he gave distinguished service in the chaplaincy of the U. S. Army. After that he spent a year in Peking, China, and a year in Mindanao, Philippine Islands. He is the author of *A Course in the Analysis of Chinese Characters*; is widely known as a translator, two of his translations being *Meister Eckhart* and *Lao Tzu*. He also has published six volumes of bi-lingual, Chinese and English, religious works.

Bob Wilson was again high up in the news in New York early in October. In the Sert Ballroom of the Waldorf Astoria, at the 18th anniversary dinner of the Automotive Old Timers, he was one of five distinguished individuals who were saluted by the petroleum industry by the award of a Distinguished Service Citation. The citation presented to Bob gives a nutshell digest of his illustrious career, which certainly merits recording here: "In recognition of his technological leadership in the development of automotive fuels and lubricants, his authorship of more than 100 technical papers, his many patents, and his scientific leadership which won for him five distinguished awards and numerous honorary doctorates; for his business acumen and administrative ability which led to his election as chairman of the board of directors of Standard Oil Company (Indiana); for his service to our government in many advisory capacities in the fields of atomic energy and petroleum and its economics; and for his deep interest in higher education as attested to by his pioneering leadership in corporate giving and his trusteeship in several institutions, Dr. Robert E. Wilson is awarded. . . ." Warm congratulations from 1916, Bob!

Back in October a letter from Dave Patten started off like this: "Yours of the 12th is well timed. And like the little dog 'Tiz,' whose mistress as she rolled down the main street decked out in her best come-hither finery, kept calling, 'Here Tiz, here Tiz,' I respond." He then mentions that, on returning from a fast motor trip 100 miles north of Detroit, he discovered in his unanswered mail an interesting announcement that started off: "Again, American Newcomen honors the United States Coast Guard, when the 16th Newcomen Lecture is given at the U. S. Coast Guard Academy at New London, Conn., U. S. A., on Tuesday, October 15, 1957." The rest of the announcement sent him to the telephone for hasty and belated acceptance. As Dave puts it: "Here 'tiz. 'The 16th Newcomen Lecturer is: Joseph W. Barker, M.S., L.L.D., Sc.D., D.Eng., L.H.D. of New York; chairman of the board, Research-Cottrell, Inc.; Member, New York Committee, in American Newcomen. Dr. Barker has had long association with the U. S. Coast Guard Academy and with ocean trade, commerce, and



navigation,' and so forth, ending, 'Dr. Barker has had broadest experience.' [Just what alphabetical designation this last superlative would require can be left to the imagination.]

"Howard Claussen motored down from Boston to attend the above, which is 40 miles more than my trip from Duxbury. Some 250 Academy students and perhaps as many more guests and officers of the Coast Guard filled the auditorium. Joe, fully recovered from his bout with do-it-yourself tools, delivered an excellent speech on this distinguished branch of the Armed Forces, founded in 1790 by Alexander Hamilton." Our hearty congratulations to you, Joe, as the 16th Newcomen Lecturer!! 16 is a lucky number!!!

Will Wylde recently came through with his bit of information for the column. He got into the paper business right after World War I and has been in it ever since. He joined the organization of Deerfield Glassine Co. of Monroe Bridge, Mass., near where he was born, 23 years ago. Says his company makes food packaging papers; and although small, it has been quite successful, expanding into Canada about five years ago by starting a subsidiary there. For a dozen years or so Will was vice-president, and last spring he became president, as the former president became chairman. Says Cy Gooding is the only classmate he has seen in the last year or so . . . believes Cy heads the various technical departments of Strathmore Paper Co., a well-known high quality paper producer in western Massachusetts. Will mentions that in the grandchild business he can't match the quantity records of others but his three-plus are tops in quality. He still is active in outdoor activities — swimming, hiking and skiing — and has a theory that anyone who can walk with reasonable briskness can ski with perfect safety if he will only take it easy. He himself expects to ski for many years to come.

Monthly luncheons of the metropolitan New York members of the Class were inaugurated in October in the new Biltmore Hotel quarters of the M.I.T. Club of New York. Joe Barker, who had initiated the new luncheon series, was suddenly downed by the flu, so couldn't attend; but the following who turned out agreed that the once-a-month idea was a good one: Steve Brophy, Art Caldwell, Del DeLabarre, Harold Dodge, Jim Evans, Herb Mendelson, Stew Rowlett, Len Stone. 11 turned out for the November luncheon.

Harold Mills, in his retirement from Bell Laboratories, continues his expertise in color photography and has gone deep into Hi-Fi. Met him on the Lackawanna Railroad one night recently as he was returning from a Hi-Fi show in New York. He also was still smacking his lips over some clams on the half shell that he had sampled in Washington Market. Last summer he and his wife Louise added substantially to their colored slide originals while on another of their cross-country drives to California, via New Mexico, Arizona, and visiting several national parks and monuments. They visited their two daughters who are located near San Francisco and Oakland.

A typical and hence interesting letter

came from Bill Drummey late in October just after he had returned "from a .1 business and .9 pleasure trip to Curaçao." (Some people are required to put zeros in front of decimal points — but not Bill!) He says his company's busy and he has no intention of ever retiring: "The main trick is to secure the commissions, and that is my job. We eat regularly." But he has cut his week to four days and is thinking of reducing it to three, which, with two vacations a year, seems to him to be a sane procedure for any comparable "Old Goat." Says his only remaining son, John (he lost two), is an officer in the State Mutual in Worcester and has produced three grandchildren — the latest, W. W. D., II, being of course "the most wonderful boy alive." Now that he has passed 60, Bill's military service is over. He retired as a full colonel, U. S. Air Force, which now means that he ranks "with the Old Ladies and the Children." He's on Governor Furcolo's staff, which reminds your Secretary that Bill, as a Staff man, was seen to take Governor Dever's place in a formal luncheon welcoming address at the Copley Plaza, when the American Society for Quality Control held its annual convention there in 1949. To balance his work in practical politics, Bill's now dabbling with oils — a new medium to him — but so far he says he's "won no battle."

In a letter some time back, Emory Kemp tells of an auto trip last March along both the east and west coasts of Florida, back through Americus, Ga., to see the solar batteries operating telephones (but thinks he must have hit the wrong road 'cause he saw no such batteries), and up through Lexington, Ky., where "we had a wonderful visit with Dina Coleman. He picked us up in his Cadillac at our motel and toted us to the hotel, where we had a most enjoyable evening. We were very much impressed with the 'Blue Grass Country' around where Dina lives. It is beautiful!" Emory hopes to take another long trip, this one about 30 days long, all this just after he retires from Camp Wellfleet in February. Says he recently went up to Boston and left his car in Harold Russell's yard, and that they agreed the boys up around Boston should have more frequent get-togethers. Also says his son Malcolm, the 1916 Class Baby, still speaks with pleasure of the 40th reunion and wishes to be remembered to all.

We understand Maurice Holland's newest book, which went to press in October at Harper and Brothers, will bear the title *Research: Management's Problem Tool*. Chapters include such titles as: "What is Management's Role in Research?" "What Should Management Expect of Research?" "Farm it Out or Do It Yourself," "Gearing Research to Markets," "Communications: Research Reports to Management." This book, two years in preparation, is we believe a "first" book on research written from the top management viewpoint. Publication date: mid-winter.

Jack Burbank reminded us that we should be sure to include the story about Hovey Freeman's son and daughter-in-law who, with others, have sailed from the Orient via China Sea and Suez to good old U. S. A. The report was made in the December issue.

Joe Meigs writes from the charming town of Sharon, Conn., 40 miles from Hartford, that he's enjoying the quiet there . . . hopes to go to Florida next winter or spring to escape some of the rigors of the Connecticut climate. Mentions that Admiral Hart, who conducted the Pearl Harbor investigation, is one of the famous citizens of Sharon. Travelers through the town are invited to stop off to see Joe.

Jack Hickey, after expressing regrets for missing the last reunion, writes that he's still in the packinghouse brokerage business with his oldest son; that six of his children, all college graduates (four boys and two girls), are now married, and that so far he is nine times a grandpop. His oldest boy graduated from M.I.T. and is an electronics engineer with Advanced Industries in Cambridge. Of the remaining eight children, one, a daughter, is in college, and the other, his fifth son, is a senior at Boston College High School. Jack's now relaxing a bit — he and his wife have taken several cruises to South America and the West Indies and hope to take still more.

Nat Warshaw says that for him a number of changes have been taking place since the 40th reunion in 1956, the most important of which was the purchase of his division at the Market Forge Company by the American Pulley Company. "This occurred just about one year ago. The new management made it very clear to me that they would like me to transfer my efforts to Philadelphia. This was a rather difficult problem, because only a few years ago I purchased a desirable home in the town of Hull within 50 feet of the Atlantic Ocean and expected to be there when there was nothing else for me to do. As long distance swimming is still my real hobby, I was glad to have ample room in which to practice; and I really hated to leave that particular spot to come to Philadelphia. Fortunately, I was able to delay making a definite change because it was necessary to travel to almost every section of the United States and visit their district managers. This took about four or five months. By that time, it appeared that this association should continue, as I have been very pleased with the work and have found Philadelphia quite bearable once we got out of the city." So now Nat lives in Jenkintown, about 10 miles north of Philadelphia, and has decided to retain the place in Hull as a summer home and as a base from which to visit his children, who still live in the Boston area, and his "wonderful grandchildren" — they now number four. He says his company recently decided to set up a research and development division for its materials-handling line, and he has taken on this obligation. He can now be addressed: The Benson, Jenkintown, Pa.

Pete Mahlman has been enjoying retirement up in Lewiston, N.Y. He's had more than his share of troubles — lost his wife three years ago Thanksgiving, and has had operations on a leg that has given him real trouble. He decided to ask for retirement to take things easy and pursue his hobbies. Says his last day at work was Friday the 13th of April (1956): "And a lucky day for me it was, for I have enjoyed life more since then — except for the absence of a wife who was very dear



to me — than I had for years." He now has very comfortable quarters with his daughter, son-in-law (a practising dentist, and a Korean veteran), and four grandsons. Has a piano which he plays for his own "amazement" as the spirit moves him, a television set, a Barcalounger ("a Godsend at times"), and all the many things that contribute to "creature comfort." He goes fishing; plays a little golf; drives to Maine to see his sisters in Lubec and to Fairport, N.Y., 90 miles away, to visit another sister. Up until February last, he used to visit his son and family (a girl eight and a boy five) in West Medford. They are now in L.A., and Pete hopes to fly out there for a visit soon.

John Fairfield's reply to a recent request for news was: "No news — too busy." As a matter of fact he has had a nine-month tour of duty as acting head of the Department of Mechanical Engineering at Rensselaer Polytechnic Institute. Says he sees John Eberhardt of Arlington, Mass., occasionally. Also reports: "A student came in with regards to me from Jimmie Evans, who saw the student wearing a Rensselaer sweater and introduced himself in Fitchburg, Mass. — just like Jimmie!"

Paul Duff is reveling in being eight times a grandfather; and each child being "so remarkable," he is basking in remarkability. Daughter Sheila went to college last fall — the eighth to start college. Son Gerry went into the Army — the sixth to enter the service. And Frances, his wife, "is showing the incredible tendency to be more beautiful every year." As for Paul himself, he believes that as he gets farther from the didactics of the young doctor, he's treating more people than diseases. Says: "I'd almost like that to be my epitaph."

Hy Ullian and his wife were in California in October. They visited their son, Joe, who is teaching formal logic at Stanford University, having taken his Ph.D. at Harvard last June. They found Stanford University a delightful place (as did your Secretary and his wife in September) and had an opportunity to look over its buildings, old and new — of special interest to Hy's wife, who is interested in ideas to take back to Radcliffe College, where she serves as trustee. Hy has issued a general invitation, good for any 1916 man who visits Boston, to drop in at his office at 255 Atlantic Avenue and watch the ships go by in the harbor.

Herb Mendelson's story of his 1957 African safari arrived too late for inclusion in this set of notes. But the following introductory paragraph from him will give you a bit of an idea of the treat in store for you in the next issue, when we'll include the high lights of his big adventure: "Not unduly disturbed by the rapier thrusts of the Tsetse Fly and Sleeping Sickness or the more gentle approach of the Malaria Mosquito, Vi and I started on our second African safari on July 24, 1957. The primary purpose — to get a black, fully mature, male Sable Antelope, a Mount Meru Pygmy Antelope or Suni, an Abbot's Duiker, and some *uninhibited* native pictures for the American Museum of Natural History. I was also anxious to add to my African trophies and movies."

Not so long ago we saw a picture in an R.C.A. publication — a group picture of 14 important-looking people sitting beside and standing behind a personage whom we all know. The caption of the accompanying article read: "R. S. Burnap Honored on 40th Anniversary with R.C.A." The occasion was a special luncheon in Harrison, N. J., last July 30. D. Y. Smith, V.P. and G.M. of the Electron Tube Division, praised Bob's many contributions in the field of standardization and technical literature. There were other words of praise, and he was presented with a handsome dispatch case. He has been manager of Commercial Engineering, R.C.A. Electron Tube Division, since 1930. Speaking of 40th anniversaries, your Secretary had one in June of last year — 40 years with the Bell Telephone Laboratories in New York — and at the end of this month of January, he joins the ranks of those who are by age-rule classified as "retired." Thus the following change of address: HAROLD F. DODGE, Secretary, 96 Briarcliff Road, Mountain Lakes, N. J.

## 1917

On Thursday of the first full week of each month a special table is set aside at the M.I.T. Club of New York, first floor of the Biltmore Hotel, for any 1917 men, whether Club members or not, to have lunch together. Dix Proctor is master of ceremonies. January 9 and February 6 are the next two dates to remember. The first luncheon in October brought together Joe Littlefield, Dick Loengard, A. Morton, Bill Neuberg, Ed Payne, and Dix. At the November luncheon Enos Curtin and Dix held the fort alone. Drop in when you can.

Notice has been received of the decease of the following: William E. Adams on August 20, Dudley F. Holden in September, Herman L. Rogers on October 21, and Dr. Harry R. Morris on February 13.

Ken Lane, class vice-president for the New York area, reports jumping from New York to Europe and back again to the Pacific Coast, along with shorter trips, in the interest of patents for his company. Another Ken, namely Ken Bell, reports: "We sail October 5 on the *Constitution* with a day in the Azores and Lisbon. We touch at Algeciras, disembark at Naples, and spend two days at the new Conrad Hilton. After that, we spend three days in Beirut visiting friends, and then on to the Karachi, Pakistan. I will do consulting work on leather for four months in both West and East Pakistan. Then, we'll visit Darjeeling to see the Himalayas, Agra to see the 'Taj'; spend a week in Ceylon, a few days in Thailand, a week in Hong Kong, a week in Japan, a week in Hawaii, a week in California; and home here in May, 1958." [How these consultants do get around.]

Hats off to Stan Dunning for editing the 40th Reunion News which has just been received as these notes are written. We hope that the reunion news will generate interest for a still bigger turnout for our 45th.

The first National Conference of the Heat Transfer Division, American Soci-

ety of Mechanical Engineers jointly with the American Institute of Chemical Engineers last August at Pennsylvania State University, was dedicated to Professor William H. McAdams, who is retiring this year after many years of teaching and research at M.I.T. A banquet was held in his honor on August 13. Congratulations, Mac. A request from the Secretary to those classmates — either class officers, or on the staff at M.I.T. — whom we frequently hear about, but not from, brought the following responses. Walt Whitman: "Life is becoming more orderly these days, although I made an unexpected trip to Japan last May to attend an Atoms for Peace meeting of industrialists. A notable feature was the warm welcome by M.I.T. Alumni in Japan, headed by Yoshinori Chatani<sup>22</sup> and his sons. Bill Sullivan was preparing to wind up his business affairs in Tokyo this winter and return to the States, perhaps to settle in Connecticut. We ventured a family reunion during July at Orleans on Cape Cod: our three children, an in-law, and seven grandchildren from one month to eight years old, for a total of 13. It's a wonderful plan, but these youngsters have too many ideas and too much energy for grandparents. It took us nearly two weeks to recover.

"The term has now started, and it's stimulating to work with the new group of students. Frankly, I think that the quality is steadily improving (although there will never be another class like 1917). Freshmen get much more faculty thought and attention than formerly, but they of course are still dominated by the private personal problems of an 18-year-old. I hope, however, that they sense the increased staff interest in them which we have encouraged in recent years. The most recent development in chemical engineering here is the growth of nuclear engineering as an area of graduate specialization. Students from all over the world are applying for admission, and we have had to adopt rigorous controls on numbers. I truly believe that our small staff is the best in the country. The completion of our nuclear reactor this winter will markedly enhance the scope and quality of our educational program, as well as provide a source of radiations for all sorts of research in physics, chemistry, metallurgy, food technology, and medicine. Lest this become a sales brochure in my enthusiasm, I'll quit now, except to express fond memories of our hot summer in the old Walker Laboratories."

Loosh Hill writes: "As directed, I herewith emerge from basking in the warmth of officialdom as class treasurer, and break into print. Here goes: (1) After our 40th Spree at Wentworth-by-the-Sea a goodly number of bills required payment, so that as of now (October 10, more or less) we have a balance of \$135.08 in the bank with no known liabilities. (2) Contrary to the experience of many members of this distinguished Class, I don't find myself feeling any younger. (2a) With respect to the statement next above, I have, and have had for some years, a most compatible, amiable and beautiful wife who, as this is written, has had her (and my) 31st wedding anniversary. (2b) We have a daugh-

ter, Mrs. John K. Stanton, who lives in Marion, Mass., and a son, pushing 26, married for approaching two years, and living in Montreal where he is fourth year medical at McGill, having graduated from Yale in 1954. Other things being equal, and after the Army gets through with him, his shingle ought to be hanging out in about five years more. (2c) In connection with (2b) first sentence, we have three grandchildren, Seabury 2nd, John Jr., and Katharine, all Stantons and ages six, three, and six months respectively and in round numbers. The grandfather can stay with grandson #1 or #2 for about three minutes, and both together for no longer than 30 seconds without approaching a complete nervous breakdown. (3) Business-wise it is my endeavor to remain solvent under present conditions, which I do not seem able to grasp; said endeavor incidentally being achieved with indifferent success. Among other things I seem to be treasurer, secretary, executive committee, director and such of Eastern Utilities Associates, a public utility holding company under the jurisdiction of the Securities and Exchange Commission (which is a story in itself), along with Enos Curtin and others of more or less the same ilk. Also chairman of the board of Fall River Electric Light Co., probably because I have more white hair than any other connected with said company. (4) Different from some, like Brooks, E.P., and Blanchard, Ray, I make it a point not to arrive at the office before 10:00 A.M. (except on occasion under duress) and to leave it along about 4:00 P.M. in the afternoon in order to get home in time for a rest, which more often than not develops into a nap. (5) And finally, I do not subscribe to the purposes of the Anti-Saloon League and thoroughly enjoy a cocktail come 6:15 P.M. of an evening when available, which it almost always is."

Dick Lyons, regional vice-president for the Southwest area, has been busy contacting classmates in his territory. He received the following from Paul Gardner: "Your letter of October 4 reached me just as I am preparing to leave Las Milpas (N.M.) to spend the winter in Europe. Things get rather quiet here after our fruit is picked and marketed and the last cutting of the alfalfa done, so there seems to be no reason to hang around. I am sailing from New York the end of the month and will have a month in Paris and then to Italy, where I made so many friends during the last war, to remain for the rest of the winter." Tubby Strout, who is class regional vice-president for the West Coast, writes that at the moment he is "in the throes of buying a little home in Burlingame, Calif., and trying to get settled." Ray Stevens reports the following biographical sketch from Mack Angas: He retired from active duty in the Civil Engineer Corps of the Navy on the first of May, 1950, with the "tombstone" rank of vice-admiral. To the uninitiated this really means that Mack was never anything more than a rear admiral but that when they plant him at Arlington, vice-admiral can be put on the rock that marks his last resting place. Mack's more important duties in

the closing years of his career in the Navy were: public works officer of the New York Naval Shipyard, Brooklyn; commander, construction forces (the Seabees), Seventh Fleet in the Southwest Pacific during the closing months of World War II; and director of the Atlantic Division of the Bureau of Yards and Docks, a detached division of the Bureau with headquarters in New York City. On the day he retired, Mack became chairman of the Department of Civil Engineering at Princeton University, a job which he still holds and of which he seems to be most inordinately and disgustingly proud, saying M.I.T. and other schools where prospective engineers are getting wonderful technical 'training' should be glad that Princeton is 'educating' a few engineers who will make excellent bosses for the M.I.T. product." Mack's job is partly administrative, but he does some undergraduate teaching and devotes a good deal of time to the graduate program in river and harbor engineering, which was initiated at Princeton after Mack joined the faculty. On the personal side, Mack's first wife died in 1952, and in 1954 he married one of his school-day contemporaries in Florida. Mack and Tracy, as she is known to her friends, spent their summers of 1955 and 1957 in Europe. The 1955 expedition was devoted to an automobile trip through France, Germany, Austria, Switzerland, and Italy; and the 1957 trip omitted Italy and included England. Mack says he expects to teach at Princeton until June, 1961, unless he gets fired before then. After that he and Tracy plan to revert to Florida crackers and live in Jacksonville. They have five daughters and six grandchildren, the oldest a boy who will be 16 before this can get into print.

Let's wind up these notes with Today's Best Smile. A college boy, telegraphing his dad for money, said: "Wolf staring me in the face." His father wired back: "Not a pleasant sight for either one of you." — W. I. McNEILL, *Secretary*, 14 Hillcrest Avenue, Summit, N. J. STANLEY C. DUNNING, *Assistant Secretary*, 21 Washington Avenue, Cambridge, Mass.

## 1918

Now that the snow is heavy on the little spruces beyond my window pane, it is pleasant to muse in the rocking chair beside my fireplace on some of the happy surprises of last summer. Among them is an unexpected and pleasant visit from Mr. and Mrs. Ed Rossman of Dayton, Ohio, who found us on their way home from Maine. Replying to the cross-questioning of your reporter, he fingered the pearls on his necklace of life as follows: After M.I.T., which he left in the spring of '17, Ed joined a supply company of the Quartermaster Corps and drove a truck for 11 months in Europe as a member of Company D, 110th Supply Train. He started as a corporal and ended up as a private due to having more brains than some captain who turned out to be also the assistant provost marshal. Lest we embarrass the shades of General Pershing, the details will be omitted. He also proudly did K.P. duty for a month as a reward for being overdue back from a leave in Paris. That's the spirit! Original

thinkers are always hopelessly misbegotten soldiers.

For a while Ed was a salesman working under Frank Scully ('15) in the employ of the Houdaille Company of Buffalo. In 1926 he went to work for the Lovejoy Shock Absorber Company of Boston. They were bought out by General Motors a year later, and manufacturing moved to the old Delco plant in Dayton, which was started by Kettering. For 11 years prior to his retirement this year, Ed was chief engineer of new products research for General Motors shock absorbers, ending up with 40 or 50 patents for the company. Of the two young Rossmans, one is a senior at Case Institute of Technology, the other a sophomore at M.I.T. Wise enough not to allow the colorful fantasies of his imagination to rot slowly, Ed is pursuing a hobby at a hard pace. He makes jewelry from semiprecious stones, gathered while hiking in likely places. The samples we saw were beautiful. Looking beyond the diversion of the moment, he and his wife were seeking a snug place to spend their retirement. We showed them the available real estate in our village, which, to their amazement as well as that of many others, is valued at prices you might not even expect in Boston. After all, there is only one Jaffrey in the entire United States, which is more than Boston, or Cambridge or Newton can boast.

Max Seltzer testifies that the party Sax Fletcher gave at his Cape Cod place for the classmates was a magnificent success. "The group included the Fletchers, George Sacketts, Clarence Fullers, Lester O'Connors, Carlton Tuckers, George Ekwalls, Eddie Rogals, David Rubins, Al Howard, Leo Cohens and son, beside Max and Selma. The prize for distance went to George Sackett and wife who journeyed 169 miles from Milford, Conn. He is now with the Armstrong Rubber Company. Incidentally, this was the first class function he has been able to attend since the 1923 reunion. The cocktails were fine, and a delicious buffet supper was served. Sax reported on the drive for \$5,000,000 to raise salaries at M.I.T. He also told us how local Alumni all over the country interview prospective students in their own communities. This process helps to get the top grade youngsters as freshmen. A lively discussion on the differences between today's curriculum and that of 1914-1918 followed, most of the information being supplied by Carlton Tucker. It was announced that arrangements have been made for the 1958 reunion at Treadway Inn, Coonamessett, for the second week end in June. Everyone present stated he would make a special effort to attend. It looks like a good start."

Our representation on the Alumni Council is now powerful and effective, for Sax is the senior vice-president of the Association. Fred Philbrick reports a balance in the class treasury of \$744.36 and goes on to say: "I am still somewhat in the dark about our 50th Anniversary trust fund, but am much in favor of doing something for the Institute in return for the great benefit we received." Some of the brethren, like Julie Avery, have on their own already returned right gener-



ously and many fold to the Institute in coin of the realm. The income from Julie's gift is to be applied to scholarships and equipment for the Metallurgy Department.

On the honors side of these notes is the winning of the 1957 Frederick Ives Medal by Arthur Hardy, who has made many original contributions to the science of optics, served for the last 17 years as secretary of the Optical Society of America of which he was president 1935 to 1937, authored the standard text on the principles of optics, and done outstanding things with color measurement and recording, as well as being an outstanding teacher. "During World War II, Hardy was chief of N.D.R.C. Section 16.3 (Camouflage) of the O.S.R.D. In that capacity, he inspired and guided researches in visibility, atmospheric optics, and the influence of color on the perception and recognition of distant objects. The vigor with which those subjects have been pursued since the war is testimony to their importance and to the impetus and sound principles of attack he initially gave to the investigations." — F. ALEXANDER MAGOUN, *Secretary*, Jaffrey Center, N. H.

## 1919

Greetings, and best wishes for a happy and prosperous New Year for you all!

Roger Hall writes from Washington, D. C.: "All's well with me and the building construction business in and around Washington, D. C. Have no news of 1919 men except Freddie Hewes, who drops me a line at intervals from his Navy retirement in sunny California, and occasionally I see Ted Saunders, who is resident here now serving his full term of duty as Captain, Civil Engineering Corps, U. S. Navy, and expecting retirement in two years. As for me, I expect to keep going as long as good health and energy permit, and as long as building contracts are available. Still waiting to hear the telephone ring when any classmates find themselves stranded here with nothing better to do than have lunch or dinner or a cocktail with me. Best wishes to you all!"

Wirt Kimball, writing from Curaçao says: "Left Port-au-Prince Sunday, will mail card from Curaçao when we arrive there Friday . . . then on to Trinidad, Martinique, St. Thomas, San Juan, and home. Having a marvelous time. We should do this on the 40th reunion."

J. J. Hanson also has been getting around the country. His card reads: "Some short treks around home, and one long one through some of the national parks and forests, including Custer State Park, S. D.; Yellowstone; Jackson Hole; and Grand Canyon. Best of luck to y'all."

Charlie Chayne, vice-president in charge of General Motors' engineering staff, speaking at the 18th annual General Motors Safety Conference, said he believes "a motorist's attitude toward driving is more important than his physical reflexes in determining whether he will wind up an accident statistic." Charlie's home address now is: 5130 Clarendon Crest, R. F. D. 3, Bloomfield Hills, Mich. Address for James P. Thurber

last October was 640 Harland Street, Milton 86, Mass.—E. R. SMOLEY, *Secretary*, The Lummus Company, 385 Madison Avenue, New York 17, N. Y.

## 1921

Happy New Year!

*Hola, Habana—Viene Veintuno!*

What better way to start out the New Year than by joining the group of some 50 of your classmates and their wives who will journey to beautiful Havana, Cuba, next month for the special 1921 reunion, which has received such enthusiastic response? Sparked, sponsored and developed by Helier Rodríguez, planned and promoted by Assistant Class Secretary Ted Steffian and his Havana Reunion Committee of Chick Dubé and Roy Hersum, this unique celebration will go down in history as one of the most outstanding Alumni events of all times. From Friday, February 21, when we will be met on arrival in Havana, through Monday, February 24, we will be constantly "in charge" of one of a number of Cuban M.I.T. Alumni and their wives who have so kindly volunteered as hosts and hostesses to make certain that we enjoy to the fullest both the planned events and the free time on a program which has been arranged to appeal to everyone.

Tentatively, the schedule calls for a tour of old and new Havana on Monday, followed by a cocktail party, special luncheon, and free evening to enjoy the gay night life. Sunday morning and afternoon are free for sight-seeing until the gala informal banquet. Monday will see the group drive through 100 miles of beautiful Cuban countryside, including the palm-studded Yumuri Valley at quaint Matanzas, to reach the crystal clear waters of famous Varadero Beach for a picnic and swimming party. After a buffet luncheon, local sight-seeing will be in order until the return to Havana late in the afternoon. Tuesday, which is a national holiday in Cuba, will see most of the guests depart for home, reluctant, no doubt, to leave an average winter temperature of 73 degrees for the unpredictable cold of late February in the States.

It is a couple of weeks before Thanksgiving as we sit here behind the opaque and unresponsive 8-ball, towards which all class secretaries must stare apprehensively for inspiration on conditions you now know to exist in this year of 1958, as well as for indication on how thoughts should be set to paper this far in advance so as to match the future accurately. In the swift completion of his appointed rounds, our dependable letter carrier has brought a special delivery missive from Ted Steffian which announces next Monday's regular meeting of his Committee for the 1921 Week End in Havana (which you now know they nurtured and developed to amazingly enjoyable proportions) and encloses a revised list of the almost 50 classmates and wives whom we ought certainly to predict as attenders at this outstanding function. This group includes the 19 couples listed in last month's 1921 Class Notes plus Josh and Mrs. Crosby, Herb DeStaebler, Chick and Mrs. Dubé, Ivan

Lawrence, Leo and Mrs. Pelkus. As you know from the October mailing sent by the Havana Reunion Committee to all 1921 men, subsequent mailings went only to those who answered that letter with an indication of interest. If you did not reply at that time and now find that you would like to join the party, contact Ted at the address given at the bottom of this column and then promptly head for the nearest travel agency to make all reservations. See you in Cuba!

It is always a pleasant reminder of old friendship to receive a letter from Ed Farrand. Writing to the entire Class in his capacity as our hard-working class agent, Ed's October letter is characteristic of his sincere loyalty and deep desire to have us all join to the limit of our ability in supporting Technology now in one or more of the urgently necessary endeavors to raise faculty salaries; provide more and larger scholarships for worthwhile young men; and to obtain funds for the legion of requirements for additional and improved facilities, a broader curriculum, extracurricular activities, and so forth. We hope you have already answered Ed and sent in a generous contribution to this year's Amity Fund. By so doing, you can proudly take part in this program to provide the Institute with needed financial aid. And only by so doing can you retain active status in the Alumni Association and continue to receive these monthly issues of the Technology Review. Also, only thus can you really say "Thank you" to Ed for his labors of love on behalf of M.I.T. If, by any chance, you have neglected to send in your contribution, please do so at once. Of course, we want you to keep on as a regular around this friendly Review hearth, whence there emerges the warmth of these notes about you and your friends.

The 1957 report on the Amity Fund, which you have already received, reveals that the Class of 1921, which is chronologically the 26th of the 66 class units reporting, is now in a tie with the Class of 1928 as the 27th in size, on the basis of its current active class roll. The number of men contributing is the 20th largest group and the percentage of those contributing is in a six-way tie for 27th position. The amount contributed by 1921 this past year is the 17th largest figure and the total amount we have given since the start of the Amity Fund is the 16th largest. The size of our average contribution is in 28th place. A good record but, with your continued help, it can be improved. Many of the Class are engaged in supporting Ed in special phases of the Amity Fund. Mich Bawden is Special Gifts chairman and his committee includes Jack Barriger, Bill Loesch, Ray St. Laurent, Dick Windisch, and Miles Zoller, plus a local group in Boston. Wally Adams is a regional chairman of the Amity Fund for the Hamilton-Middletown area in Ohio.

Arthur E. Raymond, chosen to receive the 1957 Daniel Guggenheim Medal "for the development of a long line of successful civil and military aircraft and for notable contributions to aeronautics in public service," will receive the award at the honors night dinner of the Institute



of the Aeronautical Sciences in New York City on January 28. Art has been associated with Douglas Aircraft since 1925. He has headed the engineering department since 1936 and has been a vice-president since 1939. He is a fellow of the Institute of the Aeronautical Sciences and was elected the Honorary Fellow for 1949. He is also a member of the National Advisory Committee for Aeronautics and the National Academy of Sciences and holds the U. S. Certificate of Merit for his contributions to aircraft production during World War II. S. Paul Johnston is the author of an article appearing in the September, 1957, issue of the *General Electric Review* on the subject of "The Institute of the Aeronautical Sciences," of which he is the director.

John G. Lee, research director of United Aircraft Corporation, was the principal speaker at the October banquet of the Society of Women Engineers in Hartford, Conn. John's subject was "Engineering for the Crowded Future." Since graduation, he has been active in the aeronautical field, holding engineering positions with Curtiss Aeroplane Company, the Airplane Division of Ford Motor Company, Fairchild and Chance Vought. He is also active as chairman of the board of directors of the University of Hartford. His memberships include the Society of Automotive Engineers, the Institute of the Aeronautical Sciences, the American Rocket Society, and the American Helicopter Society. Wolfe W. Brown has written an article for the June, 1957, *Bell Laboratories Record* entitled "Chairs for Telephone Operators." Wolfe has been continuously associated with Western Electric and the Bell Laboratories on central office maintenance and installation and in the design of certain central office equipment. During World War II, he took part in the development of crew trainers for both Army and Navy planes. Note for Rod Bent'19: we still like the super-comfort of the M.I.T. chair of your manufacture which the Class so kindly presented to us at the 35th reunion.

Robert J. Lawthers is the author of a lengthy article in the May, 1957, issue of the *Insurance Advocate* on "The Current Business Insurance Scene." Bob is director of benefits and pension business for the New England Mutual Life Insurance Company of Boston, with whom he has been associated since he relinquished writing for *The Tech*. A student of tax law, he has written many articles on taxes and estate planning and he is in demand as a speaker and lecturer. Edward R. Schwarz, Professor of textile technology in charge of that course in the Institute's Department of Mechanical Engineering, presented a paper entitled "Basic Actions as an Approach to Textile Fiber Processing" at the September, 1957, joint meeting in Boston of the Fiber Society of this country with the Textile Institute of Great Britain.

Whitney H. Wetherell has been named manager of the new Boston office of the machinery and systems division of the Carrier Corporation, handling large air conditioning and refrigeration installations. Whit has been with Carrier for 20 years, most recently with headquarters in the New York City offices. Following our

graduation, he taught science subjects at the Technical High School in New London, Conn., and then gave refrigeration courses at New York University. He served the engineering and construction field for 11 years before joining Carrier. He now makes his home in Newtonville, Mass. Michael Treshow of the Argonne National Laboratory has a new home address on Plainfield Road, R.R. #1, Downers Grove, Ill. T. Dillwyn Dutton of the telephone company's Long Lines Department, has moved from Washington, D. C., to 7605 Quintana Court, Bethesda, Md. Frank E. Huggins, Jr., reports moving to Mather Lane, Hunting Valley, Novelty, Ohio. Joseph C. Morrell now receives mail at 90 Bryant Avenue, Dorset 5B, White Plains, N. Y. Joseph G. Kaufman has left Boston for Daytona Beach, Fla., where his home address is 224½ North Hollywood Avenue. G. Howard LeFevre has moved his offices to 62 William Street, New York 5, N. Y., where he is vice-president and manager of metal sales of the U. S. Smelting, Refining, and Mining Company. Richard H. Morris has joined the Technical Publishing Company, 308 East James Street, Barrington, Ill.

Orville B. Denison '11, known to all of us for his peerless song leading ability, demonstrated at all major Technology functions, and more famous as the secretary of the outstanding Class of 1911 and its class agent, was awarded the M.I.T. Bronze Beaver at last September's Alumni Officers' Conference. It is a distinct personal pleasure to know that Obie was so recognized and honored, and we express warm congratulations from all of us.

It is with heavy heart that we report the passing of two classmates and extend sincere sympathy to their families on behalf of the entire Class of 1921. Robert Baker Donworth died on September 24, 1957. Born in Seattle, Wash., on May 14, 1897, he obtained the bachelor of arts degree from Yale in 1919 and was graduated with us in Course XV with the bachelor of science degree. He had long been associated in various engineering capacities with the Duquesne Light Company of Pittsburgh, Pa., and rose through the ranks to become vice-president in charge of engineering and construction. He was in charge of the design and construction of the new Shippingport atomic power generating station. In preparing for this task, he attended the Reactor School of the Oak Ridge National Laboratory for two years and was awarded a diploma as "Doctor of Neutron Husbandry." His memberships included the American Society of Mechanical Engineers, the American Institute of Electrical Engineers, the Engineering Society of Western Pennsylvania, the American Nuclear Society and the Duquesne Club of Pittsburgh. He is survived by his wife, Mrs. Harriet Grier Little Donworth; and three children, Robert B. Donworth, Jr., Yale '47; Eleanor G. Little, Vassar '49; and James G. Little.

Meade Ashley Spencer, vice-president of the architectural firm of Charles Bacon Rowley and Associates of Cleveland, Ohio, died on October 7, 1957. He was born on April 4, 1896, at Sandusky, Ohio.

In 1917, after three years at Princeton, he volunteered for ambulance duty in France during World War I. He then obtained the bachelor's degree with us in Course IV. At the Institute, he was a member of the Architectural Society and served on its executive committee. He was elected secretary and treasurer of the honorary architectural society, Frieze and Cornice. Following graduation, he served as a designer for Cross and Cross in New York City and joined the Rowley firm in 1927. He is survived by his wife, Mrs. Emily Stickney Spencer; two sons, Michael and Christopher; and a daughter, Nancy.

*Hola, Habana — Viene Veintuno!* Get those summer suits out of storage and pack up for the warmth and fun of a stay with the gang in Havana next month. Those in the vicinity of M.I.T. should attend the Midwinter Alumni Association meeting on Tuesday, February 4, at Walker Memorial (dinner) and Kresge Auditorium (meeting) and arrange to join the 1921 group for cocktails at 4:00 P.M. at the Faculty Club, just prior to the dinner. This class party is in charge of Josh Crosby, Chick Kurth, and Lark Randall. In any event and wherever you are, don't fail to join the Class, wives, children, and our guests at the coming Alumni Day events on campus in Cambridge on June 16, 1958. — CAROLE A. CLARKE, *Secretary*, International Telephone and Telegraph Corporation, Components Division, 100 Kingsland Road, Clifton, N.J. EDWIN T. STEFFIAN, *Assistant Secretary and Chairman*, *Havana Reunion Committee*, 11 Beacon Street, Boston 8, Mass.

## 1922

Our president, Parke Appel, has been making class news this last month with his excellent coverage for the 40th Anniversary Gift Program. He has even scheduled regional meetings and encouraged attendance at Joe Conrad's lecture series as he trips merrily across the U. S. Special attention is also called to the Faculty Salary Fund. This is because of the prominence of our Class and that those gifts also help toward our \$80,000 annual goal for the next five years. Please sign up early so that we will become distinctively remarkable rather than only outstanding champions. Edwin A. Terkelsen has been candidate for re-election to his fifth term as alderman-at-large from ward 5 at Newton. Terk was elected to the Board in 1949 and has served on the public works, franchises and licenses, public buildings, legislation, street traffic, street renaming, and municipal parking and meters committees. He has been chairman of public works since 1954. In business, he has been with the Terkelsen Machine Co. of Boston for 35 years. He has also been treasurer of the Newton Highlands Congregational Church for many years and especially active in fund raising drives. The Terkelsens live at 5 Cochituate Road, Newton Highlands.

Among those who presented papers at the fall general meeting in Chicago of the American Institute of Electrical Engineers were Everett M. Strong with a subject of "Graduate Honors Co-operative Programs" and Max J. Steinberg on "In-

cremental Maintenance Costs of Steam-Electric Generating Stations." We regret to report the passing of Captain James E. Kiernan on October 6 at his home in New York. He was a winner of the Distinguished Service Cross and was on his latest assignment hull superintendent at the New York Naval Yard in Brooklyn, where he supervised the construction of the battleships *North Carolina*, *Missouri*, and *Iowa*. We have also regretfully received word of the passing in the early part of the summer of Frank G. Loud of South Weymouth, Mass. Under the heading of change of address, we understand that George S. Holderness has moved from Brooklyn to 145 Midland Avenue, Bronxville, N. Y. Stanley D. Whitford is now with Pass and Seymour at 1440 N. Pulaski Road, Chicago 51, Ill. We hope to bring you a report on George Dandrow's Silver Stein Award in our next notes.

Your Secretary has joined in the enthusiasm of local and national statements for our President Jim's appointment by President Eisenhower as Special Assistant for Science and Technology. Never has there been such unanimity of opinion on the excellence of such a selection as for Jim Killian. He has made M.I.T. a greater institution and given us a greater future for which we will all strive. — WHITWORTH FERGUSON, *Secretary*, 333 Ellicott Street, Buffalo 3, N. Y. C. GEORGE DANDROW, *Assistant Secretary*, Johns-Manville Sales Corporation, 22 E. 40th Street, New York 16, N. Y.

## 1923

With Howard Russell, your dependable and hard-working secretary, enjoying a vacation in sunny Florida, his assistant for the first time must grab a pen and carry on. Looking back to November, Howard, we sincerely hope that your sojourn in the warmth of the southern sun prepared you for the snow, ice, and cold of the winter.

Now it is January and, before any of you let your thoughts wander, note and note well that June 13-15 is only five months distant. That's right, only 20 weeks to our 35TH REUNION to be joined at THE PINES, COTUIT, CAPE COD, MASS. Your reunion committee is enthusiastically organizing a restful, relaxing, pleasant, enjoyable program and three-day holiday for you. Each one on the committee wants to see you present with your best girl to reminisce with us on the events of the early 'twenties and to renew old acquaintance. Only you can make it an accomplished fact for yourself. So when the reservation blanks appear in a few weeks—take immediate action. You do your part and we'll do ours.

Julius A. Stratton, VI, chancellor of M.I.T., called for an increase in U. S. scientific research at groundbreaking ceremonies on November 4 for a Harvard—M.I.T. basic physics research project. His speech marked the start of the first joint effort of scientists of the two Cambridge universities into basic research on the properties of sub-nuclear particles and atomic nucleus forces. Julius was again in the news two days later when it was indicated that he would serve as acting president of M.I.T. during the

time that Dr. James Killian is in Washington as Special Assistant to the President for Science and Technology.

Milton E. Parker, VII, has returned, after a leave of absence, to the Technology Center of the Illinois Institute of Technology and will resume his duties as director and professor of food engineering. He has been active during the past two years in connection with the production development of a condensed whole fish product while serving as president and director of Commerce and Industry, a Boston company, and Sea Products Corporation of New Bedford.

The Union Carbide Corporation has announced the appointment of R. K. Turner, X, as president of Bakelite Company. Kibbe began his association with Union Carbide in 1924 in the research department of the Chemicals Company at Clendenin, W. Va. He progressed through this division to become general superintendent of the South Charleston plant in 1940, and in 1946 moved to New York to fill the post of assistant works manager for the company. He became vice-president of Bakelite in 1952.

Arthur W. Davenport, I, who has worked on power projects in several states, has been named project manager by Stone and Webster Engineering Corporation for the firm's work in Sao Paulo, Brazil. Stone and Webster is building a 250,000 kilowatt expansion to the Piratinga steam station of Sao Paulo Light. Arthur began his career with S. and W. while still at the Institute as a student working summers as a carpenter's helper, electrician, structural inspector, and assistant master mechanic.

From Alabama we learn that Dale S. Davis, X-A, was named head of the Department of Pulp and Paper Technology in the University School of Chemistry. Professor Davis taught chemical engineering at Wayne University and Virginia Polytechnic Institute and was associated with International Paper Co.

Professor Sherwood F. Brown, XIV, chairman of the Physics Department at Colby College in Waterville, Maine, has been granted a year's sabbatical leave to do research in ceramics at M.I.T. The physical and chemical state of the colorant which produced the Ming Red Glazes is still unknown, and Professor Brown will devote time to a solution.

Standard Oil Company of Indiana has placed Dr. Ernest W. Thiele, X, associate director of research, at the head of a new committee to evaluate research suggestions made by a scientist "outside his own field of endeavor."

Howard will be on the job again with next month's news. In the meantime look over that circular on THE PINES once again and circle the dates of June 13-15 on your calendar. — HOWARD F. RUSSELL, *Secretary*, Improved Risk Mutuals, 15 N. Broadway, White Plains, N. Y. WENTWORTH T. HOWLAND, *Assistant Secretary*, 1771 Washington Street, Auburn-dale 66, Mass.

## 1924

Now that we're in the grip of winter, at least those of us up north, it's good to know that the Junior Tennis movement

goes on apace. Certainly Chairman Tressel is doing his best to keep it moving. Periodic bulletins show that Mart is getting around the country pushing this development program of the U. S. Lawn Tennis Association. If there's a tournament in Kalamazoo he's there—or Chicago or Salt Lake City or Tampa. Says our old tennis champ, "Tennis is a way of life."

Obie Denison, eagle-eyed 1911 secretary, has forwarded portraits of a couple of our classmates from local papers. One shows a lady being handed a Certificate of Merit from the United Nations by Chairman Webster B. Brockelman of the Framingham (Mass.) board of selectmen. Web, against a background of Old Glory, is wearing his best official smile. The other shows Dr. Hudson Hoagland in the act of turning over a bit of sod for the start of a half-million dollar addition to his Worcester Foundation for Experimental Biology.

In November the American Meteorological Society met down in Texas. One of its speakers: Mrs. Francis L. Whedon on the subject, "History of Meteorology in the U. S. Army Signal Corps." Mrs. Whedon (Francis Bliven), a graduate in physics, has been with the Signal Corps since early in World War II, is now in the Office of the Chief Signal Officer. Wyatt, Inc., area fuel distributors of New Haven, has made some top-level changes, among them a new vice-president in charge of operations, Philip D. Blanchard. After many years in the Midwest, Phil joined Wyatt seven years ago. Among his manifold activities, he is president of the Union League Club, not to be confused with the Philadelphia outfit of the same name.

A few months ago the Southern Electric Generating Company got a new president, James F. Crist. Jimmie has been a V.P. and director of the parent Southern Company for some years. The Generating Company builds and operates large power facilities for Alabama and Georgia power companies. And if you don't think Jimmie is a real southerner, just listen to this by a Birmingham columnist, "He is as Southern as the hills he and his associates rift, the waters they roll and acclaim, the Alabama coals they dig, the Southern suns they weight, the multiplied lightnings they command in the South's electric age." There's even more along this line, and it ends, "Jimmy Crist is as fine a human sum totals as the modern South offers." This feller must write for the Chamber of Commerce in his spare time!

Last spring Case's dean of the graduate school, Dr. Elmer Hutchisson, was appointed director of the American Institute of Physics. Maybe you saw his picture in *Life's* post-Sputnik story with the quote, "In Russia scientists and teachers are esteemed." Matter of fact, if you didn't you must have seen it in "M.I.T. Alumni Make News." That piece is not out as this is written, but it will be long before you read these lines.

"Wardwell Named to New Screw Firm Post," said the *New Bedford Independent* in July. Charles Huntington Wardwell had just been elected president of the Continental Screw Company. Hunt had been treasurer for some 15 years. Maybe



at our 35th reunion, two years hence, we can get him to sail that yacht of his down to the Cape and take us all cruising. Dick Shea is at it again, writing that is. This time it's a 468 page, \$12.00 job called *Transistor Circuit Engineering*. He had a number of co-authors, but Dick was the editor. This in spite of the fact that he's not really in the transistor business any more, but is at General Electric's Atomic Knolls Power Laboratory outside Schenectady, where he is "striving mightily to hitch up electronics and nucleonics. What the result will be — godnose!" The Sheas have three daughters, two married; they are two-time grandparents.

Big Heat Transfer Conference at Penn State this summer had papers by a raft of M.I.T. men, among them Professor Hoyt C. Hottel, "Radiant Heat Exchange in a Gas-Filled Enclosure." Ed Winger must be slowing down. Claims he hasn't been anywhere exciting recently except for a trip to Mackinac Straits when he got a preopening ride across the new bridge. Our prize traveler, Hank Simonds, showed up this fall in Cambridge, after just completing his 15th round-the-world trip. His young son met him here, and after putting his ship in dry dock Hank bought a car and they were headed back home to California.

By the indirect route President Littlefield has achieved new stature. He is now the grandfather of twins, one of each, born to his daughter Jane. "A father is not very important, but the grandfather of twins is way, way down the list." Don't know where Jane lives, but if it's nearby he'll discover the importance of grandparents when the kids want baby sitters! Dr. Edward A. Saibel, mechanics professor at Carnegie Tech, accepted an appointment as visiting professor of mechanics at Rensselaer last fall. Ed got his S.B. with us, then went to Cornell for a couple of years and came back to the Institute to pick up a doctorate.

Just received information of the death of Captain Oscar A. Saunders, U. S. Army retired, in Florida. Captain Saunders was an Army Ordnance man with our Class.

Looks as though the only Institute Visiting Committee member this year will be William H. MacCallum. Bill has been a member of the Humanities Visiting Committee, has now been renominated for a second term. The first of those '24 luncheons at New York Club's new Biltmore quarters was held in October. An even dozen showed up and evidently a good time was had by all. They're monthly — 12:15 on the Wednesday of the second full week of each month. If you're in town and can make it let Nate Schooler know — Flush Metal Partition Corp., 46-10 11th Street, Long Island City.

That's about it for now. A good year to all of you. May it bring you health, happiness and wealth — and don't forget to share the latter with the Alumni Fund. — HENRY B. KANE, *Secretary*, Room 1-272, M.I.T., Cambridge 39, Mass.

## 1925

The response to President Fred Greer's letter regarding the 35th reunion has been very good to date. About 800 letters were

sent out, and 173 replies have been received as of November 15. If the reply card is still sitting on your desk, would you please add a few check marks and drop it in the mail? A report on the responses will be made in due course.

Only a few news items have appeared during the past month. From Poughkeepsie, N.Y., a release from the I.B.M. Research Laboratory indicates that Dr. Arthur L. Samuel, VI-A, has recently been appointed resident manager. He was previously research advisor, and his new assignment gives him an area of additional responsibility. Dr. Samuel joined I.B.M. in September, 1949, as a development engineer in charge of research and advanced development. Three years later, he was promoted to assistant manager of the Poughkeepsie Engineering Laboratory and became research advisor in September, 1953. He was instructor in the Electrical Engineering Department at M.I.T. following his graduation; was later a professor of electrical engineering at the University of Illinois; and in addition, has been associated with the General Electric Company and the Bell Telephone Laboratories.

A couple of months ago, mention was made of the work of Mrs. Mary Morrison Kennedy, who, as architect-decorator and second vice-president for the Sheraton Corporation, just completed the interior decorating work for the new Sheraton Hotel in Philadelphia. Mrs. Kennedy is in charge of decorating for the entire Sheraton chain, which at last report totaled 45 hotels. She spends two weeks of each month at her headquarters in Boston, where six busy architects carry out instructions. The other two weeks she is on the road, visiting hotels and sampling her own wares in rooms she decorated herself.

A fair number of address changes pass over the desk of your Secretary each month; and in case you desire to contact any member of the Class, feel free to ask this office for the latest address. Whenever they appear of more than passing interest, mention is made in the Alumni notes. During the past month, a change has come through for John C. Dempsey, XV, who has been living in Hinsdale, Ill. He can now be reached in care of Shell Company, Bachaquero, Estado Luvia, Venezuela, South America.

Among the cards returned as the result of Fred Greer's letter was one from the wife of Raymond F. Johnston, XIII, noting that her husband passed away on March 11, 1957. — F. L. FOSTER, *Secretary*, Room 5-105, M.I.T., Cambridge 39, Mass.

## 1926

This is an issue when our most important notes item will not be news. It has already been in the headlines of every newspaper and magazine in the country, but it is so important to '26 men we can still talk about it. We, of course, refer to Jim's appointment as special assistant to the President. Your secretary was attending the theater at the Playhouse in Wilmington, Del., and missed the television address by President Eisenhower; but an early morning edition of the Phila-

delphia paper was being sold outside the theater, and it carried the story. I am sure my reaction was no different from that of every other '26 man — one of great pride that our classmate had been called to serve our country. It was a great day for the Class of '26, for M.I.T., and, for our country.

We have quite a collection of clippings — let's take a glance at them. One from New Haven, Conn., reports the death of Bowman McKennan, who graduated with our Class in Course XV; he had been chief engineer for Connecticut Coke Co. for some years. A more pleasant item tells of the appointment of Chet Buckley as president and general manager of the Standard Transformer Co. of Warren, Ohio. Congratulations Chet! Dick Pough is reported once again as a speaker on "Nature Conservancy," this time by the Biddeford, Maine, *Journal*. Dick is president of Wildlife Preserves, Inc., and lives in Pelham, N. Y.

Phil Robinson has been made plant superintendent at the Latchford Glass Co. in Los Angeles, and a photo with the clipping identifies him as looking much the same as we remember him. Phil and his wife live in Downey, Calif., with their three boys, twins 13 and a third boy 10. Phil wrote us some time ago about his travels installing and designing glass plants — one of which was in India. The natural question that comes up is — did Phil spend six months in India while Bill Rivers was there without knowing another '26 man had spent half of his life in India? Bill Rivers now appears to be having the time of his life as director of the Indian Steel Training and Educational Program at Carnegie Tech.

Ted Mangelsdorf has moved up again in the Texas Co., this time to senior vice-president in charge of the Company's world-wide refining interests and activities. Just about now Guy Frisbie should be returning from a visit to his daughter in northern Italy. Guy wrote us some time ago for the address of Fred Walch in Paris, so we are looking for a report of the trip and of the meeting with Fred.

This week your Secretary was in Detroit on business and ran out to Livonia to pay a visit to Gordon Spear at the Fisher Body plant. Gordon gave us a personally conducted tour of this most interesting factory that makes all of the interior trim for the Buick, Pontiac, and Oldsmobile cars. We were impressed with all the combinations of colors, sizes, and materials that go into door panels, upholstery, roof liners, and so forth, which in turn are distributed to assembly plants all over the country. The immensity of the operation was also impressive — a million square feet of floor on the site of the Hydromatic plant that burned so tragically four years ago. Everything was, of course, running like clockwork as one would expect under the watchful eye of a '26 man. Gordon reported on a visit from a '26 man most of us have not seen since graduation, Shantanu Kirloskar from Poona, India. Shantanu is director and general manager of Kirloskar Oil Engines, Ltd., and manufactures diesel engines up to 5 horsepower. He is planning to go into large diesels; that is presumably what brought him to Detroit.



Class Agent Pink Salmon sent along a couple of clippings recently about '26 men for which we are duly grateful. One tells about the new ultramodern plant just completed by Hersey Manufacturing Co., of which Don Cunningham is vice-president for manufacturing. Hersey moved from the site where the business was started in 1859 to a site on Route 128 in Dedham—guess we will have to plan a visit to this plant next. The other mailing received from Pink is a 25-page brochure by Commonwealth Services, Inc., business and engineering consultants. Two Class of '26 men are featured (with their photos): Leonard Milano, who is in charge of business development; and Stuart John, in charge of rates. The brochure seems to indicate that Leonard is sales manager and Stuart is an adviser and expert in pricing of public utility services.

Speaking of public utilities, Earle Lissner has been with the Public Service of New Jersey for 29 years in Hoboken, Weehawken, and Secaucus. He reports that industry is finally replacing pigs in the last mentioned location and that the last pig is scheduled to leave in November, 1958. Earle also reports that General Foods and Standard Brands have now flooded the Hoboken area with coffee—a far cry from the days of prohibition. Earle invited us to the wedding of his most attractive daughter to a young sales trainee in the Du Pont Co. We were terribly sorry not to have been able to make it—nor were we able to make the wedding of Charlie Rich's daughter at Swanton, Vt., which we had also sincerely hoped to attend.

Before we run out of material for future months, just a word about the television program. I reported some time ago that "Harbormaster" was filmed this summer with Rockport as the backdrop. We have only seen one program, since it is shown Saturday nights and we have never installed a television at Pigeon Cove (reception here is poor). However, the program we saw was most corny and we understand that all since have been the same; but the scenery is good. Therefore, the only thing we make claim to, of course, is the scenery. Until February, best to all.—GEORGE WARREN SMITH, General Secretary, c/o E. I. du Pont de Nemours and Co., Room 325, 140 Federal Street, Boston, Mass.

## 1927

Clarence L. Wynd, Eastman Kodak Co. vice-president, has been elected to the Corporation of Massachusetts Institute of Technology. He has served as a member of the Visiting Committee to the Department of Chemical Engineering since 1955. Assistant Secretary of the Army Dewey Short has presented Donald F. Horton with a silver engraved tray in recognition of completion of 30 years of service in the Department of Defense. Horton's civilian assignments have been in the Department of the Army and Office of the Secretary of Defense. He is also a colonel, U. S. Army Reserve. His home is in Bethesda, Md.

A two-day conference in Hartford featuring the application of weather in-

formation to business problems included an address by Professor Henry G. Houghton, chairman of the Department of Meteorology, M.I.T. Theodore E. Caselman, Jr., has been appointed chief chemical engineer of Stone and Webster Engineering Corp. He had been a senior project engineer since 1953, specializing in the design and engineering of chemical, petroleum, gas, and other industrial plants.

We are happy to announce the election of Wes Meytrott as vice-president of sales of Consolidated Edison Company. He has been closely associated with the New York Consolidated since 1933 and was named assistant vice-president in 1953.

We have received a really long letter, which follows, from Amund Enger: "While it is quite true that I moved to Sweden last year, this does not represent any major change for me. The fact is that my family has always operated two factories—one in Oslo, Norway, and one in Amotfors, Sweden—but aside from the fact that they are in different countries, the actual distance between them is not more than 100 miles or three hours by car (on our roads that is), and I have always spent a great deal of time here at the Swedish factory but have up to now always lived in Oslo.

"The change of residence thus does not really mean any great change in work. The reason for moving was that our president here retired upon reaching retirement age, and as we had no one that we could replace him with for the time being, I took over the job. Swedish law requires that I be a resident of Sweden in order to have that job, so I moved. I am still also president of the Norwegian plant, but as the distance is so short between them, it is just like you would have two plants, one in New York and the other in Connecticut.

"A contributing reason for my taking over the job here was that our sales of sporting and target ammunition on the American market have been taking on nice proportions, at least in comparison to our annual business here; and I wanted to follow it as closely as possible. All that ammunition is manufactured here in the Swedish plant, and I felt that I could do a better job if I was here more or less permanently.

"The move was quite a change for my wife. I remarried some years ago an American girl, who was originally from Mississippi but had lived in New York for seven years before we were married; and the change from New York to Oslo was great, but the change from Islo to the village of Amotfors was still greater. It is a far cry between New York and Amotfors, let me tell you. However, we spend quite a few week ends in Oslo, where we have a number of nice American and Norwegian friends.

"As you know by now, I was not able to be present at the reunion this year; but I hope to be able to go back to New York next year sometime on business."

Vic Severs, Société Française de Techniques Lummus, 100 Rue de Rivoli, Paris 1, France, writes: "Dear Classmates: Left New York on February 5, 1957, for an assignment of approximately two years in

Paris with the Lummus Company. The particular work is project manager for the company in charge of the engineering and construction of a 40,000-barrels-a-day oil refinery for Esso at Bordeaux. Expect to complete the work by January, 1959."

Bethlehem Steel's shipbuilding division has named Richard H. Tingey nuclear power manager. He will be in charge of all the nuclear work, which at present includes contracts for the hull of the Navy's first atomic-powered guided missile cruiser, and the first nuclear power plant for a destroyer. Dick has been with the shipbuilding division since graduation.

Here is a listing of those who made it to Alumni Day at M.I.T. last June: Arnold, Berle, Bigelow, Boyle, Burley, Campbell, Chase, Church, Collins, Duffy, Franks, Hawkins, Henry, Jackson, Johnson, Marcucella, Moineau, Nowland, Perry, Staples, Stevens, Taggart, Willcutt, Wise, and Wynd. Burt Houghton has moved to London. His new address is c/o the Geophysical Prospecting Co., Ltd., 20 Albert Embankment, London S.E. 11, England. On the occasion of James K. Small's 30th anniversary with Esso Research and Engineering Company, the following was received concerning his outstanding career: "Mr. Small's role in Esso Research has always been akin to the company's progress and new developments. The Summit man was with a pioneering group which, in 1927, organized and set up the affiliated Esso Research Laboratories in Baton Rouge, La. He saw the Louisiana labs grow from 15 men to 250 in three years. During World War II, he did research work on synthetic rubber raw materials in Esso Research's chemicals research division. And, as director of the patent division, he has watched and helped pave the way for the growth of the company's patent division. Fluid cracking, hydroforming, butadiene, oxoalcohol, butyl rubbers are some of the Esso Research developments Mr. Small has seen come along."

Always glad to see members of 1927 participate in Alumni affairs. Bill Taggart has been elected to the executive committee of the Alumni Association.

Another 30 year veteran of New Jersey Standard, Bud Fisher, is now taking up the responsibility as joint managing director of Iraq Petroleum Co., Ltd., and its affiliated companies. He dropped his duties as Jersey's ranking man in Europe to devote his full time to I.P.C. The *Oil and Gas Journal* says: "As a key management man in the I.P.C. operation, Fisher must wrestle such mountainous—yet delicate—problems as moving oil from landlocked Iraq to tidewater through hundreds of miles of pipelines crossing foreign territory. Only last year I.P.C.'s pipeline pumping stations were sabotaged in Syria during the Israeli-Egyptian battling. Output in Iraq, normally 700,000 barrels daily, still has not recovered. I.P.C.'s operations include not only Iraq but also production of 125,000 barrels daily in Qatar and exploration in Trucial areas of southern Arabia.

"Although Fisher is now a crude-oil man, his wide experience and training did not hint at this role. He has held top

administrative jobs with Jersey for most of three decades — but never on the producing end."

It is with regret that we record the death of Paul C. Hitchcock, general manager of the *Hibbing Daily Tribune*. For two years after graduation he was with Eastman Kodak as consulting engineer. — J. S. HARRIS, *Secretary*, Shell Oil Company, 50 West 50th Street, New York 20, N. Y.

## 1928

Two members of our Class have been nominated by the executive committee of the Alumni Association for membership on the Departmental Visiting Committees. These nominations are to be submitted to the M.I.T. Corporation for approval: Committee on Geology, Carl M. Loeb, Jr.; Committee on Aeronautical Engineering, Benjamin S. Kelsey.

Jack Grant (Course V) visited Cambridge recently and called on your Assistant Secretary, who happened to be away on a business trip to Jack's home town. Jack is still with Owens-Corning Fiberglas Corp. at Newark, Ohio, and occupied with advanced research and patent matters relating to the company's business. If we can get our business trips better co-ordinated, we may be able to talk with Jack next time and have a more extensive report on him.

In our recent correspondence with Maurice Beren (Course X), we learn that he has graduated to the presidency of his company, Pyrotex Leather Company, Inc., Leominster, Mass. Maurice has been with the company since 1930 and until recently was its vice-president. Maurice says he and his wife, Rose, are planning to be at York Harbor in June for the 30th reunion and is eagerly looking forward to the event. — GEORGE I. CHATFIELD, *Secretary*, 49 Eton Road, Larchmont, N.Y. WALTER J. SMITH, *Assistant Secretary*, 15 Acorn Park, Cambridge, Mass.

## 1930

Bob Baldwin still resides in Altadena, Calif., and although he says nothing exciting has happened to him this year, he sends his best wishes to his classmates.

Joe Barrett has written us from Nantucket, Mass., that he has a radio amateur license and can be heard on six meters. His call is K1CCK and he would be glad to contact any classmates on this band.

Hank Bates sent us a clipping from the *New York Times* datelined August 13, 1957, announcing his election as vice-president of the parent company of the Johns-Manville Corp. and his appointment as director, administrative services, to supervise the newly-created administrative services organization which serves all departments and divisions of the Corporation. Hank joined Johns-Manville in 1936, and for nine years he has been attached to the office of the Chairman.

Al Deyarmond has been in Santa Barbara since March, 1957, with the Technical Military Planning Operation (TEMPO) of the General Electric Company. Before that he was with the Ryan Aeronautical Company in San Diego, where he was chief of the preliminary design group be-

fore he left. He thinks Santa Barbara is one of the most beautiful cities on the coast. Though he rarely sees any of the other '30 men, he did run across Fred Dickerman at the Naval Aviation Meeting of the T.A.S. recently in San Diego.

George Gasset writes that he received an assignment to go to Japan for six months and sailed for Tokyo shortly before this Christmas with his wife and two daughters. He will be supervising design of new Ethylene and Butadiene plants for NPPON, Petrochemicals, Ltd., under contract with Stone and Webster Engineering Corp. He and his family expect to return to their home in Hingham, Mass., about the middle of June, 1958. George adds a note to say he hopes to see everybody at Oyster Harbors in 1960 at our 30th reunion — if not before.

We note that Arne Gudheim delivered a paper with James Donovan<sup>28</sup> at the Heat Transfer Conference and Exhibit held August 11–15, 1957, at Pennsylvania State University. The paper was entitled "Heat Transfer in Thin Film, Centrifugal Processing Units." The conference, by the way, was dedicated to Professor William H. McAdams<sup>17</sup>.

Joe Harrington, our treasurer, and his wife, Alene, recently spent a combined business trip and vacation on the West Coast. He spoke at the E.I.A. Symposium in Los Angeles on "Numerically Controlled Machine Tools." He and his wife touched San Francisco and Seattle on this trip. Joe says the high point of the year for him was the matriculation of his son, Joe 3rd, at M.I.T. in Course IX-A. He has not decided yet what his career will be, but he is leaning strongly toward mathematics. When he gets his degree, he will be the third Joseph Harrington to graduate from M.I.T., and Joe 2nd wonders if this will be a record of some sort.

Wayne Hertzka is still practicing architecture in San Francisco and his jobs are primarily commercial and office buildings such as the completed America Fore Insurance Group Building in San Francisco this year. He is associated with Skidmore, Owings, and Merrill on the new Crown Zellerbach office building now under construction.

A newsclip from the *Hartford Times* date lined August 31, 1957, indicates that Charlie Lutz has joined the electronics department of Hamilton Standard as chief of advanced design. This department was organized recently as a virtually autonomous unit at the plant's branch in Broad Brook, Conn. He will be responsible for systems management, operations research, and preliminary design activities covering the missile and electronics field.

The *Boston Globe* of October 18, 1957, carried a story about the marriage of Hijo Marean's son, Lieutenant David F., to post-debutante Julia Sawtelle. The ceremony was performed at 4:00 P.M. in the Old North Church, Marblehead, Mass., on October 12, 1957.

Ralph Peters sent us a newsclip from the *Sarnia* (Ontario) *Observer* dated September 20, 1957, about E. Ralph Rowzee. The article stated that 15 years ago Ralph Rowzee drove up from Akron, Ohio, to help establish what was to become Polymer Corporation, Ltd., and remained there. Today he is president and managing

director of this Crown-owned corporation established by the Canadian Government. A student of the development of synthetic rubber, Ralph is now a leader in the field which captured his scientific interests while he was employed by the Goodyear Tire and Rubber Company in Akron, Ohio. His appointment is merited and will doubtless be acclaimed at the proper time and place by the federal government, to which Polymer Corporation is responsible.

Through the publishers, John Wiley and Sons, Inc., we have learned that a book entitled *Electrical Engineering Circuits*, authored by our classmate Hugh Skilling, was released last March.

We received a letter from the general personnel supervisor of the Bell Telephone Company in Philadelphia in which he told us of the promotion of Harold Spaans to plant supervisor — Merchandising Central Plant.

The following changes of address have been received: Arnold S. Ackiss, 317 Dedham Avenue, Needham 92, Mass.; Robert S. Cook, 448 Hoodridge Drive, Pittsburgh 28, Pa.; William C. Dickerman, Jr., 20 Beekman Place, New York City 22, N.Y.; Earl E. Ferguson, 12 Astor Place, Glen Ridge, N.J.; Lieutenant Colonel John A. Mathews, 1721 Rockhurst Avenue, Dayton 10, Ohio; William W. Thomas, 17 High Street, Newburyport, Mass. — GEORGE P. WADSWORTH, *Secretary*, Room 2-285, Department of Mathematics, M.I.T., Cambridge 39, Mass. RALPH PETERS, *Assistant Secretary*, 249 Hollywood Avenue, Rochester 18, N.Y.

## 1931

Note: Dave Buchanan has called our attention to the regular Class of '31 luncheons of the M.I.T. Club of New York at the Hotel Biltmore on the third Monday of every month, at 12:15 P.M. Classmates from out of town as well as those working in New York, please note.

Enjoyed hearing from John Elting recently. John, who is director of Research Laboratories for the Kendall Company, Paw Creek, N.C., wrote: "I do a great deal of traveling, mostly through North and South Carolina and Alabama, although week after next I will go to Chicago and New Orleans. A couple of weeks ago I was in Boston. I seldom have occasion to stop in New York and, of course, like all country boys, I thoroughly dislike the big cities. It is bad enough to put my shoes on when I travel. Our five children are growing up. The oldest boy is in the Navy, currently in the Mediterranean; my next boy is in military school and thoroughly enjoying it. My daughter, age 17, will go to college next year. This pretty much leaves us with two smaller boys, ages 10 and 12, which keeps us plenty busy, although the family is rapidly getting smaller. I don't have to write anyone to let them know that I am a poor correspondent. It is certainly good to hear from you and the others once in a while. I haven't heard from Duckie Graham in a long time, although he telephoned from the airport several years ago when he was passing through. I don't know where he is now."

Word from the Institute tells that Rear Admiral Clarence E. Ekstrom is now



Commander, Fleet Air, Eastern Atlantic and Mediterranean. His address is Com Fair Elm, Navy #510, F.P.O., New York.

According to an article in the October *Fortune*, Emilio Collado, who is treasurer of Standard Oil of New Jersey, co-authored an article in July's *Foreign Affairs*, in which it was argued that the United States oil companies spend even more on foreign investments than is indicated by published statements because foreign outlays, such as exploration and development oil field costs, are treated as operating rather than investment costs. This would add another two billion dollars a year to the actual foreign investments, he reasoned.

Noticed that Gordon Brown broke into the M.I.T. Newsletter for November. For more than five years, he has been active in revising the curriculum of the Department of Electrical Engineering. Gordon is quoted as saying: "Electrical engineers who learn only to go to the handbook for recipes . . . are not prepared to cope with new developments. We should prepare students not only for electrical engineering as it exists today but to play a creative role and to lead the electrical engineering of tomorrow."

Changes in address received since the last class notes are: Lieutenant Colonel Arnold Boogher, 1620 Via Vista Drive, Redlands, Calif.; Dr. Albert H. Cooper, P. O. Box 359, Ridgewood, N.J.; Robert M. Kelly, 704 Front Street, Weymouth 88, Mass.; Cecil W. Kennedy, 1975 - 51st Street, Brooklyn, N.Y.; Lawrence G. Mohr, 10710 River Road, Rockville, Md.; Frederic W. Nordsiek, 30 West 60th Street, New York 23, N.Y.; J. Jerome Oleksiw, 224 Ridgeway Road, Weston 93, Mass.; Myrle M. Perkins, 2090 Broadway, San Francisco, Calif.; Robert T. Puffer, Puffer and Company, Inc., 1228 Washington Street, Watertown, N.Y.; Dr. David T. H. Shaw, 15-17 Rue Gazan, Paris 14, France; Fred W. Smith, 7252 Ford, Warren, Mich.; Robert K. Wilson, 432 Rose Lane N., Haverford, Pa.; Francis E. Wolosewick, Vern and Alden Co., 33 N. LaSalle Street, Chicago 3, Ill.

## 1932

In the November issue of *The Review* we summarized the events of our reunion week end. In the December issue the photograph of the banquet took our allotted space. Now we should like to bring you up to date on some of the changes which have been reported in the occupational status of some of our classmates.

In the higher echelons of industry we note that John Lawrence has resigned as president of Joy Manufacturing Company of Pittsburgh to become vice-president of Dresser Industries, which have just made a big step in consolidating with the Gardner-Denver Corporation. Stuart R. Fleming, XVII, has just been made a vice-president of Ford, Bacon and Davis, engineers and constructors of international repute. Stuart has been with that firm since 1935 and has worked on the design and construction of many industrial plants and public utilities systems. At the time of his election to the high office in his company he was directing the natural gas projects out of the company's Vancouver office.

Oscar T. Marzke, III-G, who received his doctor's degree in metallurgy with our Class and who is known to many members of our group, has just been made vice-president for fundamental research of the U. S. Steel Corp. in Pittsburgh. Your Secretary had dinner with him and his family shortly after they had moved to Pittsburgh. Oscar has been director of the Naval Research Laboratory in Washington before returning to his old company, with which he was associated before World War II.

Otway W. Rash, X, was with Monsanto at the time of our reunion. When Monsanto sold its household detergents products to Lever Brothers, Dub went to New York to advise Lever on matters pertaining to the manufacture and marketing of ALL. He told us he was looking around at the time, and the latest report states that he now has a high position with the Carling Brewing Company in Belleville, Ill.

Word from some of our military friends indicates that Colonel James E. Harper, Jr., XVII, is now in the headquarters of the Armed Forces Special Weapons Project in Washington. Things are quite different there from what they were in Alaska, where Jim was for a number of years. Colonel Arthur L. MacKusick, II, has left Washington for a 16-month tour of duty in Korea. He is now commanding officer of the U. S. Army Ordnance Group in Seoul. He and his wife were at our reunion, but had to leave early in order to attend the graduation of their son Larry from West Point. Later in June they attended the wedding of their son, Second Lieutenant Arthur L. MacKusick, Jr., to Miss Patricia Lee Tyler. Poor Art never had time to recover from all of these events before being sent to Korea. F. Caryle Roberts, Jr., a commander in the U. S. Public Health Service, has been shifted from Pittsburgh, Pa., to Kansas City, Mo., as sanitary engineer in the regional office.

A high honor has come to one of our classmates, Harry M. Krutter, VIII. The announcement reads: "The Distinguished Civilian Service Award, the highest honor which the Secretary of Defense can bestow on civilians, has been presented by Mr. Charles Wilson to Dr. Harry Krutter, chief scientist at the Navy's Air Development Center, Johnsville, Pa. Secretary Wilson recognized Dr. Krutter for 'his outstanding scientific achievements in connection with the development of radar and electronic equipment now used in the country's Airborne Early Warning airborne equipment and for providing the nation with an important and timely improvement in its capability to defend itself.' Mr. Wilson said, '[Dr. Krutter's contribution] . . . warrants the highest recognition which can be given an employee of the Department of Defense.'"

Dr. Krutter has been associated with the Naval Air Development Center, the Navy's largest aeronautical research and development activity, since 1949. He and his wife reside in Lynnewood Gardens in Elkins Park, Pa. Their daughter Marjorie, a sophomore at Penn State, is majoring in sociology."—ROLF ELIASSEN, Secretary, Room 1-138, M.I.T., Cambridge 39, Mass.

## 1933

Look at the calendar, son. Yes, it's 25 years since our Class ventured (or was plunged!) into the industrial world. The early experiences of most of the Class would make the present day Tech product wonder in virtual disbelief. But we all survived and, hopefully, we are the better for it. Come on back to Cambridge with your bride on June 14 for a three-day session of fun and relaxation. View the scenes of your earlier crimes and triumphs. Gather material for those stories of your college days that you want to pass on to the younger members of your tribe to help them as they set forth. And your wife will find many kindred spirits who will gladly swap yarns about the trials and tribulations of coping with the younger generation.

All of his friends will be glad to hear that Norm Harris, XV, recently became vice-president and sales manager of Standard Plastics in Attleboro, a company that has long had the benefit of the drive and the savvy of Fred Murphy, also XV. Fred, who is thinking up favors to spice our reunion, retains his trim figure and his Irish wit. Congratulations, too, to Joseph Bird, XIII-A, who has become vice-president of Dynaform Corporation, an unusual company which is doing development work in the forming of metals with explosives. Joe is in the Detroit area and lives in nearby Birmingham. The Class extends its best wishes to William C. Hinckley, Jr., on his marriage to Patricia Lockhart of Jackson Heights, N.Y. We look forward to greeting both of them on June 14.

In the news: John G. Danielson, IV, a Boston architect who has been appointed to the faculty at the New England School of Art; Morris Cohen, III (a professor at Tech and also on Charlie Bell's reunion committee), who spent some time in the early fall in Europe, including Russia, on an exchange of metallurgical scientists with the Moscow Steel Institute. Morris also had primary responsibility for serving as host to Niels Bohr, the Nobel prize winning physicist, while Dr. Bohr was at M.I.T. last fall.

We are delighted to make special mention of Emile Bustani, I, described by the press as "engineer-legislator," for his part in helping to resolve some of the sticky problems in the Middle East. Emile has carried on his talks in London and New York as well as at home in Lebanon. With his well recognized abilities and his personal knowledge of the psychology of the people of the U. S., England, and the Middle East, Emile should contribute in a major way to easing the tension. We note too that Paul Genachte, VI, spoke at the Atomic Industrial Forum in the late fall on the subject "Implications of Foreign Requirements."

If you have not done so, send your reunion questionnaire back pronto—you want to be included in the class record and we want you to, too. Your Secretary would most welcome a word from you; we want to share news of your doings with the rest of the Class through these pages.—R. M. KIMBALL, Secretary, Room 3-234, M.I.T., Cambridge 39, Mass.



As Walt McKay told you, I left M.I.T. on July 1, 1957, to accept a position as vice-president for Academic Affairs at the Case Institute of Technology in Cleveland, Ohio. Case has an enrollment of 1600 undergraduates and 750 graduate students carrying on studies in the areas of engineering, science, and management. The Institution is in a period of dynamic growth. Approximately one-half of the physical plant has been rebuilt within the last 10 years, and a large portion of the remaining campus will be reshaped during the next 10 years. The faculty is a strong one and is doing a major job in defining the roads which education in engineering, science, and management will take. The research program is an excellent one, well distributed through various departments and very well integrated into our graduate education.

Case has taken the leadership in the imaginative planning of the development of the University Circle area, an area of some four square miles in which there are located 34 institutions of higher learning and culture. The plan envisages a beautifully integrated cultural center which, when completed, will be quite unique in providing an educational environment appropriate for the dominant position which Case is aiming for in the role of education. I hope very much that any of the Class of 1934 who go through the Cleveland area will call me so that we can get together.

Recently, I met Ed Sylvester at the Union Club and we talked over old times, particularly our experiences on the hockey team, where we played side by side for three years. Ed is now president of the American Ship Building Company in Cleveland, Ohio, and he commutes between his home in Chicago and Cleveland. Many of you may have seen his picture in the latest issue of *Fortune* showing that leanness, health, and dignified grayness go with being a successful executive.

A recent issue of *Iron Age Magazine* selected Jake Jaeger vice-president, chief engineer and a director of Pratt and Whitney Company, Inc. He is pioneering development of numerically controlled machine tools.

New positions which members of our Class hold are: Sam Groves (for some time president of United Carr Fastener Corp. in Cambridge), a director of the Boston Manufacturers Mutual and the Mutual Boiler and Machinery Insurance Company; George Priggen, Jr., automotive sales manager of the White Star Division of Socony Mobil Oil Company, Inc.; Bob Roulston, sales manager of the Injection Molding Machine Division of the Lombard Governor Corp. of Ashland, Mass.; Charlie Hill, general factory manager of the Racine plant of Massey-Harris-Ferguson, Inc.; Tim Coleman, vice-president of Union Carbide Development Company, Division of Union Carbide Corp.; Tom Apjohn, manager, Petroleum Chemicals Department of Mobil Overseas Oil Company.

Gil Lorenz was recently honored by the U. S. Army Engineering Research and Development Laboratories, Fort Belvoir, Va., where he was given an "outstanding"

rating for his work as chief of the Map Compilation branch at the Laboratories.

I have had zero letters from the Class of 1934 in preparing these class notes. How about coming through with news about yourselves and your plans so that we part time secretaries do not have to fill the articles half full of stuff about ourselves. John A. Hrones. — WALTER MCKAY, *Secretary*, Room 33-217, M.I.T., Cambridge 39, Mass. JOHN A. HRONES, *Assistant Secretary*, Vice-president for Academic Affairs, Case Institute of Technology, University Circle, Cleveland 6, Ohio. MALCOLM S. STEVENS, *Assistant Secretary*, Room 3-139, M.I.T., Cambridge, Mass.

## 1935

My apologies for missing so many issues of *The Review*, will try to do better in the future. Stephen F. Perry of 785 Clark Street, Westfield, N.J., has recently been appointed an engineering associate in the petroleum development division of the Esso Research and Engineering Co., in line with this company's expanded technical progression program. This program was designed to offer promotion, prestige, and recognition along the technical line equivalent to that of administration.

George S. Schairer has been nominated by The Alumni Association for the position of Alumni member on the M.I.T. Corporation Visiting Committee for the Department of Aeronautical Engineering. Last summer the Hooker Electrochemical Co., Niagara Falls, N.Y., appointed Dr. Thonet C. Dauphiné manager of product development in plastics. Besides being an active member of many engineering societies, he is the current president of the M.I.T. Club of Buffalo and Niagara Falls.

One of those who gave a paper at the June meeting of the American Society for Engineering Education was William R. Weems. In past copies of *The Review*, I have quoted from his most interesting letters from Korea. His paper was entitled "Aiding an Engineering College in Korea, an Operational View." I have a copy of his paper which I will be glad to send to any interested classmate.

Frank S. Walters has been appointed rate engineer in charge of the Rate Department of the Potomac Electric Power Co. Frank has been with Pepco since 1935. At the Fall General Meeting of the American Institute of Electrical Engineers, Kenneth N. Mathes presented a paper entitled "International Activities in the Temperature Classification of Electrical Insulating Materials." Brigadier General Joseph M. Colby is now head of the Ordnance Ammunition Command. He formerly commanded the ordnance section that designed and developed tanks for World War II. Paul Cohen, engineering section head for submarine armament in the Naval Armament Computers Engineering Department of the Surface Armament Division, published a paper entitled "The Effects of Errors in Sonar Bearings on Fire Control" in the January, 1957, issue of the U. S. Navy *Journal of Underwater Acoustics*. Gerald M. Golden is now living at 42 Sun Hill Lane, Newton Center, Mass. Jerry is President of the Lang-

ley Co. in Cambridge, a material handling concern.

Dr. Clarence D. Davis was appointed associate professor of obstetrics and gynecology at Yale Medical School last spring. In addition to his teaching of graduate and postgraduate courses, he will be the chief investigator in the inter-departmental research project on cerebral palsy.

I hope you have all seen Henry King's letter and have already made your contribution to the Alumni Fund, being very careful to mark it "Class of 1935 Scholarship Fund." — FRANCIS W. MULDOWNEY, Jr., *Secretary*, 1109 Boylston Street, Chestnut Hill 67, Mass.

## 1936

Bob Worden, as you know, has been working hard on the Special Gifts Solicitation program. He deserves a great deal of credit and all the co-operation and assistance you can give him. Knowing Bob, I'm sure he would much prefer the co-operation and assistance to the credit — so let's drop him a line and get our 25 Year Gift off to a good start. Bob's address is Worden and Risberg, Fidelity-Philadelphia Trust Building, Philadelphia 9, Pa.

Since the December notes we have received additional news on Paul Robbins. He has been executive director of the National Society of Professional Engineers for the past 11 years. In addition to his talk before the Worcester section of the American Institute of Electrical Engineers at its annual dinner at the White Cliffs in Northboro, Mass., Paul recently spoke to the local society of Wilmington, Del. The affair took place at the Du Pont Country Club. He discussed the national organization objectives. During World War II, Paul served in the office of the mayor of New York as engineering training consultant and became director of civilian training for the New York Port of Embarkation when that facility was activated by the Army.

Our Class was represented at the 54th meeting of the Acoustical Society of America, held at the University of Michigan, Ann Arbor, by Franklin Cooper. The subject of his paper was "Some Cues for the Distinction between Voiced and Voiceless Stops in Initial Position." I'm afraid I can't expand on this bit of information except to say that Ann Arbor reminds me that Semon Knudsen was speechmaking on radio recently. Between the halves of the game at Ann Arbor, Semon made a big pitch for Pontiac. For a general manager he did a good job as a pitch man. (For more on Bunky, see December notes.)

Our good friends Tony Hittl and Jim Patterson sent in the following on Dorian Shainin: "We had lunch with Dorian yesterday. He was passing through New York on his way to Detroit to give two talks covering his work on the application of statistics to industrial problems. He has been particularly concerned with quality control but has done considerable work in other fields of statistical applications."

"At the present time, Dorian is very interested in some work he is doing with a hospital near Hartford. He is attempting

to determine the causes of diseases which are now not too well understood. By means of statistical analysis of the data, he hopes to be able to isolate the significant factors responsible for the disease. For a start, they are working on a disease of the bones. He says this is a far cry from the work he was doing five years ago at Hamilton Propeller and is one of the reasons he is so interested in his present job.

"Dorian's present trip will take him back and forth across the country for the next two weeks with numerous speaking engagements. Sorry I can't repeat the entire itinerary, but suffice to say he sounds like a politician running for office. Dorian seems very happy with his work and reports that his department with Rath and Strong has built up from nothing to an important part of that consulting firm's business. He now has some 14 engineers working under him.

"Jim, at least you cannot accuse me of not writing you any news. Tony." CLASSMATES — PLEASE REREAD THE LAST SENTENCE ABOVE AND EXAMINE YOUR CONSCIENCE.

Ed Nicholson is an assistant manager in refinery liaison with Esso Research and Engineering. Currently, Ed is in Europe. By the time these notes are printed Ed will be in charge of Esso Research and Engineering Company's newly-established refinery liaison office in The Hague, Netherlands. The new office is being established better to serve European affiliates of Standard Oil Company of New Jersey by providing more frequent consultations and visits. Ed's home address in the Netherlands is Papeweg 7, Wasse-naar. Ed stayed on at the Institute after we departed and served as an instructor for a year before joining Esso. He started with the Esso Research and Engineering Laboratories in Baton Rouge, La. From there, he went to the company's Linden, N.J., operation.

A Navy selection board announced the selection of professor of naval construction for the rank of rear admiral. The new rear admiral is E. C. Holtzworth (XIII-A, S.M., Class of 1936), professor of naval construction and in charge of Course XIII-A, 1947-1949.

May we repeat again — just a few additional sentences can make an interesting news item out of a dull announcement. — JIM LEARY, *Secretary*, One Putnam Park, Greenwich, Conn.

## 1937

The next issue will be reported by Jerry Salny, so now is a good time to drop a line to Jerry and help him with lots of information.

Robert Vogeler has organized his own electronics firm in Byram, Conn. The firm, called Sigmadvne Corp., makes a line of magnetic amplifiers, heat and speed control devices, telemetering filters, and saturable reactors. Best of luck, Bob, in your new venture.

Grandville R. Jones reports that he, his wife, Maria, and their three children have moved to 1306 Oxford Place, Charlottesville, Va., and that he is now working for the Sperry Piedmont Division of Sperry Rand Corp. Bob Rudy writes, "Sorry I

missed you-all at the reunion." Bob is chairman of the technical committee and the arrangements committee of N. Y. Materials Handling Society. The Rudys, with their two children, live at 160 Riverside Drive, New York City.

Al Woll had a visit this past summer from Len Seder while Len was in Evansville, Ind., doing consulting work with Mead Johnson Company. Al and his wife, Pearl, with their three children, live at 1350 East Powell Avenue, Evansville, Ind. He is self-employed as an oil producer and in farm management. Sounds interesting. Al Herman Brettman visited Cuba recently in connection with a preliminary study of power requirements and plant design. At present, he is designing a power plant at Calais, Maine. Hy is in business for himself and his firm is the Utility Engineers, 359 Boylston Street, Boston. The Brettmans — Hy, Beatrice, and their two children — live at 47 Glendale Road, Marblehead, Mass.

The response on the request for material for a biographical sketch on the members of our Class has been good. This issue we request those of us whose last name begins with either a C or D to send the pertinent information about the different positions you have held; your family; books, pamphlets or articles you have written; your Army career; clubs; travels, and so forth.

Our class treasurer and class gift chairman, Joe Heal, was born in Rio de Janeiro on March 29, 1915. In 1920 he moved to Hingham, Mass., where he attended school. After three years of high school, he transferred to Thayer Academy, which he attended for two years, graduating in 1933. Joe was very active in scouting and became an Eagle Scout when he was 15. During his four years at M.I.T., Joe was president of Phi Mu Delta; captain of the wrestling team; active in track and football; and vice-president of T.C.A. Following graduation, Joe took a position with American Steel Foundries in Hammond, Ind., as Archie Ahmadien did, as a special apprentice handling experimental work plant layout and time study. He then took a position, as did Duane Wood and Alden Acker, with the Lockheed Overseas Corp., in the Production Control Division, helping to purchase and organize for the Northern Ireland base. Joe traveled to Langford Lodge, Northern Ireland, as production control supervisor under Duane Wood. From 1944 to 1945 he took a position with the Navy Lockheed Corp. in Van Nuys, Calif., as supervisor of fabrication planning and control.

At the end of the war, Joe thought that California had had it; so he headed east via Florida. He almost took a teaching job in Brazil (headquarters in Miami), but decided against it. Joe then took a position in the family concern of Spaulding-Moss Company of Boston (1945 to present) as assistant to the general manager, handling company industrial engineering work. The Company is made up of four divisions: Offset Printing; Sales, selling Thermo-Fax Copying Products; Merchandising, handling drafting supplies and Ozalid paper and machines; and Reproduction, with two branches, making blueprints, photostats, microfilm and Xerox printing. The Company employs approxi-

mately 350 people and has sales of five to six million dollars. In 1956 there was a company reorganization, and Joe was made executive vice-president and general manager.

Since returning to Hingham in 1945, Joe has been active in community affairs. He has been scoutmaster of the Hingham Troop; active in several positions in the Society for Advancement of Management; president and a playing member (cello) of Hingham Symphony Orchestra. He tore down a firehouse and built his home from top to bottom; is now building an additional room; has been taking singing lessons for the last year and is getting a great kick out of them; with a boy going to scouts, is now head of the Troop Committee; and has aided with the planning and organizing of the class reunions and class gift.

Joe married Marion Schroeder in January, 1938; they have a boy 12 and a girl 17, who will be going to college next year. For sports, he enjoys swimming, hiking, and skiing the best. During the winter, he tries to get up to several of the ski resorts. Joe also tries to get in some camping, hiking, and water skiing in the summer. During the last few years he has been spending several weeks in Florida in the winter and ended up buying some lots on the Keys, 25 miles this side of Key West. His best vacation was a trip which he took to Mexico City and Acapulco, by land, in 1953.

Joe Heal also reports that matters are off to a fast start on the Class Gift. Serving on the committee, of which Joe is chairman, are the following vice-chairmen: Boston, Ralph Webster; New York City, Al Busch; Buffalo and Rochester, Ralph Chapin; Hartford, Wally Wojtczak; Cleveland, Dick Young; and Los Angeles, Stan Zemansky. A good start to a job we all want to help get on its way. In fact, right now is a good time for all of us to make a few New Year's resolutions: (1) make out our pledge to our Class Gift, remembering what each one of us has received from the Institute; (2) resolve to write at least one letter a year to one of your class secretaries.

The following changes of address have been reported to us: Dr. Dean A. Lyon, Ansonia Road, Woodbridge, Conn.; Joseph J. Sousa, 20 Walter Lane, Hamden, Conn.; Stanley D. Zemansky, 725 W. Houston Avenue, Fullerton, Calif.; Al Faatz, 3 Briar Hill Road, Montclair, N.J.; Floyd Schultz, Quarters A, Naval Shipyard, San Francisco 24, Calif.; George Wemple, Apartment 17L, 2-5th Avenue, New York, N.Y.; Han T. Liu, 43 Roosevelt Road, 3rd Section, Taipei, Taiwan.

The Midwinter Alumni Conference will be held on February 4, 1958, at the Institute. Sounds like a good date for those Alumni in the nearby locality to get together. Notify your Secretary if you plan to attend, so that we can make some appropriate arrangements for our Class.

In closing our notes, all of your class officers wish you and your family a Happy New Year. — ROBERT H. THORSON, *Secretary*, 506 Riverside Avenue, Medford 55, Mass. S. CURTIS POWELL, *Assistant Secretary*, Room 5-323, M.I.T., Cambridge, Mass. JEROME E. SALNY, *Assistant Secretary*, Egbert Hill, Morristown, N.J.



The summer's accumulation of notes is gradually being depleted. One such item tells us that Lyndon Crawford was nominated for the school board in Lyme, Conn. We haven't heard about the election. Lyndon is with Electric Boat in Groton.

In Dayton, Ohio, John Sullivan, Jr., has been elected president of the Dayton Art Institute. John is a member of the firm of architects, Yount, Sullivan, Lecklider.

Our military colleagues are as active as ever. Colonel Alvin Welling has been appointed engineer commissioner for the District of Columbia. He comes to Washington from Heidelberg, Germany. He has seen service in many parts of the world and has had responsibility for the construction of 500 miles of the Alcairn Highway and part of the Burma Road.

Colonel Willard Roper is attending a 10-month course at the Army War College, Carlisle Barracks, Pa. He is one of 200 senior officers undergoing training at the Army's highest educational institution. His previous assignment was with the Office of the Chief of Engineers, Washington, D.C.

Colonel Burton Bruce has been named First U. S. Army Engineer. During World War II he was commanding officer of the 91st Engineer General Service Regiment in New Guinea and base engineer at Port Moresby and Biak Island. On returning to the United States he served in the Office of the Chief, Army Engineers, in Washington, for three years, followed with a three years' assignment as engineer instructor at the M.I.T. Reserve Officer Training Corps. After attending the Army War College in 1953 and 1954, he was assigned to the engineer branch of the Logistics Division at Supreme Headquarters Allied Powers in Europe, returning from this last post in June of this year.

Finally on the military front, we find that Milton Wallace is now with the U. S. Army Construction Agency in Frankfurt, Germany. He transferred from Fort Hood, Texas.

Jack Wilber is now supervisor of the process engineering department of Plant 7 of the Norton Company in Worcester. Jack joined the company in 1946 as a manufacturing control engineer. — DAVID E. ACKER, *General Secretary*, Arthur D. Little, Inc., 30 Memorial Drive, Cambridge, Mass.

## 1939

Top of the column this time goes to Wiley Corl because he wrote me a letter to send in some news. Hint: anyone else desiring to make the first paragraph will please write.

Wiley said he was manager of utilities with Kuljian Corp. at Philadelphia and was chiefly interested in the promotion of public utility power plants and other extensive projects involving architectural-engineering services, studies, and so forth. As he was at school so is he now — always plugging hard for a new project. He'd be glad to hear from classmates on business and on pleasure and will probably be very active in planning for the reunion which will be coming up next year.

I believe many will be interested to learn of one of our favorite professors, Paul Eaton '27. Paul is now dean of students at California Institute of Technology at Pasadena.

I saw him there last week and enjoyed luncheon with him at the Faculty Club as we exchanged comments about old friends and our expanding girths and increasing gray hairs.

Al Laker returned from his 30-day boondoggle in Scotland, England, France, and the Low Countries. He had some beautiful colored slides which he ran off for us. He does a great job on the scenery outdoors, but I must say there wasn't much record of what he saw and did on the Montmartre.

George Cremer was recognized in the October issue of the *Metals Review*. On page 10 there is his picture, as chapter chairman of the San Diego American Society for Metals. Picture shows him heavier than he was when he was doing giant swings on the high bar at Walker in 1939, but the article didn't say how he found time to fatten up. Here is the good word:

"George D. Cremer, senior staff engineer, Solar Aircraft Co., has a background of many years' experience in powder metallurgy and ceramics, including time spent at Manhattan Project, Los Alamos, and Oak Ridge National Laboratory. He earned his S.B. at M.I.T. and is a member of the American Rocket Society and Institute of Aeronautical Sciences, as well as A.S.M.

"To quote a fellow member, 'His dynamic personality, unswerving devotion to A.S.M., and his ability unerringly to select interesting topics has made him indispensable to the San Diego Chapter. With his capable leadership we are looking forward to another rewarding year.'"

Well, George, if Casselman, your old fraternity brother, were here, we'd both take out a few paddles and start in on the thesis whether it is advisable to write such stuff about a guy while he is still living. But since he is 3,000 miles away, making more money than ever for Polaron, we'll have to defer this fun until later. In the meantime, congratulations and keep up the good work.

Speaking of good work, John C. H. Lee, Jr., must have put in some, because he was promoted to full colonel and has been chosen to attend the Air War College for a year. John would like to hear from his buddies. Address is Quarters 906A, Maxwell Air Force Base, Ala.

News from overseas comes from Harry Wexler, who is chief scientist at Antarctica for the Geophysical Year Project. Harry, when you get this please write back and let us know if it's true what they say about the penguins.

Ed Morin was the subject of an article in the Bath, Maine, *Times*. The article said: "Edward G. Morin has been named a staff engineer in the engineering coordination unit of the Esso Research and Engineering Company. In his new position he carries the staff responsibility for engineering services the company provides for affiliates of the Standard Oil Co. (N.J.) in Germany and Rotterdam in the Netherlands. Mr. Morin and his family are located now in The Hague, where his new office is located."

I was delighted to hear President Eisenhower say last night (November 7) that he had chosen President Killian to head up the missiles program. My second thought, knowing what a terrible place the Washington bureaucracy is to get anything done, was that Jim sure has a big job ahead of him. Let's, as we are able, give him a hand. — HAL SEYKOTA, *Assistant Secretary*, 416 Calle Mayor, Redondo Beach, Calif.

## 1940

While it is normally a pleasure to prepare this column, such is not the case this month since, with regret, I must record the passing of two of our classmates.

John MacKerron died on August 10, 1957. John was a student in Course IX-A at Tech and was a member of the Chemical Society, Sedgwick Biological Society, Nautical Association, and Outing Club. I have no other information to report at this time, but if I obtain further details I will include them in a subsequent Review.

Richard Berry, who majored in electrical engineering, died of a heart attack at his home at 49 Pond Street, South Weymouth, Mass., on October 27, 1957. Dick was assistant general manager of the Thomas Edison Company in Boston. He is survived by his wife, Mary, and a son, Richard. Members of the Class who attended the 15th reunion will recall how jovial Dick was at that affair; and it is, indeed, a shock to realize that he has passed away at the age of 40.

The ranks of bachelors in the Class has been further decimated with the marriage of Major Edward Butler Williams, Jr., to Jacqueline Melbourne Brown. Major Williams is in the Air Force and, in addition to graduating from Tech, has a degree from the Meharry Medical College.

At the fourth annual conference of the Atomic Industrial Forum, Inc., in New York City, October 28-30, several of our classmates gave talks. Tom Creamer, who is vice-president of the First National Bank of New York City, talked on the "Participation by a Commercial Bank"; and W. Kenneth Davis, who is director of the Division of Reactor Development of the U. S. Atomic Energy Commission, had the topic "The Government's Program and Plans."

Amos Shaler, who is head of the Department of Metallurgy at Pennsylvania State University, has been selected by the American Society for Metals as the outstanding young teacher of metallurgy in the country for this year.

Julius Molnar, who received his doctorate with us, has been elected a vice-president of Bell Laboratories. Prior to joining Bell, he was with the National Defense Research Committee and with Gulf Research and Development Company. At Bell, Julius conducted research in physical electronics and in the development of microwave tubes. In 1955 he was appointed director of Electron Tube Development and later he became director of Military Systems Development and then director of Military Development.

At the American Society for Engineering Education, Kenneth Fox, who is asso-



ciated with Fabric Research Laboratories, Inc., gave a paper on "The Place of Science and Engineering in Textile Education." At the fall meeting of the American Institute of Electrical Engineers, John Parnell presented a paper on "Reliability of Instruments Power Supply for Reactors."

Thus, it can be seen that members of the Class have been active in numerous lines. You, too, have been doing something of interest to classmates. Kindly write your Secretary and let him know. — ALVIN GUTTAG, *Secretary*, Cushman, Darby, and Cushman, American Security Building, Washington 5, D.C. SAMUEL A. GOLDBLITH, *Assistant Secretary*, Department of Food Technology, Room 16-325, M.I.T., Cambridge 39, Mass. MARSHALL D. MCCUEN, *Assistant Secretary*, 4414 Broadway, Indianapolis 5, Ind.

## 1941

Belated holiday greetings to all of you; in the press of putting last month's column together, I completely overlooked the fact that it was the last column of the year. May 1958 be a good year for everyone; my sentiments, though slightly impersonal, are none the less sincere.

Carl Stewart made his own progress report this time, for which I'm sure we're all grateful. He writes: "I was especially glad to hear from my thesis partner, George Bises, who wrote from Madrid where he was working on a power plant job for Gibbs and Hill. I would have liked to answer each of the letters personally, but it is only rather recently that I have been able to handle this electric typewriter with much success and there is so much to be done I don't know what to do first. I was transferred from Harrisburg Hospital over here to Mount Sinai (New York) in the middle of May. At that time I was out of the iron lung but still dependent upon a rocking bed all but a few hours a day. Now I'm sitting up in a wheel chair 14 hours a day and use a chest respirator only when sleeping. Indications are that I may be able to do away with that, too, in the near future.

"Of the 13 patients now here at the respirator center I consider myself the most fortunate in that I have good use of both hands, limited only by the lack of upper arm muscles to move them through a normal range. The occupational therapy department here has come up with very ingenious arm supports which largely overcome that handicap. Just last week I got the good news that the Pennsylvania Railroad has a job waiting for me in the engineers' office at Altoona Works. The railroad has gone all out to give me every assistance possible. Over the Labor Day week end I made my first trip home and was there again early in October. The way things are going now, I hope to be there to stay by Christmas. Our present home in Harrisburg was not designed for wheel chair living, but that matter will be corrected when we move to Altoona." Thanks a lot for the report, Carl; and keep up the good work.

Norman Moore, who received his doctorate in physics in 1941, had the main executive responsibility for the Western Electronic Show and Convention, held in

the Cow Palace in San Francisco, with 753 exhibition booths. A physics instructor and later on the staff of the M.I.T. Radiation Laboratory, he went to California in 1943 as director of Research and Development for the Dalmo Victor Company. During 1947-48 he was an acting associate professor of electrical engineering at Stanford University. In September of 1948 he joined Litton Industries of San Carlos, Calif., as a project engineer. Two years later he became director of engineering; in 1952, vice-president; and he is now vice-president and general manager of the Electron Tube Division.

Prominent in a news picture of Convair, Sperry, and Air Force officials was Bob Edwards, who, as Sperry's engineering manager for the B-58, is working on navigation and guidance systems for the new bomber.

Several members of the Class have presented papers at various technical conferences lately. At the fourth annual meeting of the Atomic Industrial Forum in New York City, whose theme was "The 1957 Nuclear Industry, Problems and Progress," Frank Pittman of the Division of Civilian Application, U. S. Atomic Energy Commission, spoke on "A.E.C. Licensing Policies and Procedures with Regard to Reactor Safety"; Arthur Stevens of the Budd Company, on "Radioisotope User Experience with Commercially Available Instruments"; and Carl Hasek of the Babcock and Wilcox Company on "Nuclear Merchant Ship Reactor." At the National Conference on Upper Air of the American Meteorological Society in Omaha, Robert Fletcher, president of the Society, gave the opening address, and Jerome Namias spoke on "Prevailing Mid-Tropospheric Wind Forecasts for Five- and Thirty-Day Periods by Numerical Method." At the first National Conference of Applied Meteorology in Hartford, Dr. Fletcher also made the opening remarks. At the Heat Transfer Conference and Exhibit at Pennsylvania State University, Yeram Touloukian gave a paper on "Heat Transfer in Liquid Metals"; and at a meeting of the American Society for Engineering Education at Cornell University, Stan Backer gave one on "The Place of Science and Engineering in Textile Education." Also active in technical society work are J. Melvin Biggs, professor of civil engineering at the Institute, who is chairman of the Structural Section of the Boston Society of Civil Engineers; and Arthur Weber, vice-president and director of engineering of the Corning Glass Works, who is a regional vice-president of the American Society of Mechanical Engineers.

John Wilson, previously general sales manager, Cleveland Welding Division of American Machine and Foundry Company, has been named general manager of marketing for Metals and Controls Corporation, a manufacturer of electrical control devices, composite and precious metals, and nuclear fuel elements for atomic reactors. He has been with A.M.F. since 1946 holding the positions of chief engineer, Buffalo Engineering Department; assistant general manager, Pin-spotters Division; sales manager, Buffalo plant; and works manager, Leland Electric Division, Dayton, Ohio.

James Jump has recently moved his firm to Greenwich, Conn., and is "Celebrating 10th anniversary as management consultant on industrial marketing problems, new commercial product development, and diversification studies."

Dwight Mowery, previously professor and chairman of the chemistry department of Ripon College, Ripon, Wis., has been appointed the head of the new graduate school of the New Bedford Institute of Technology. — IVOR W. COLLINS, *Secretary*, 28 Sherman Road, Wakefield, Mass. HENRY AVERY, *Assistant Secretary*, Pittsburgh Coke and Chemical Company, Grant Building, Pittsburgh 19, Pa.

## 1942

It was a pleasant surprise to receive the first issue of the *Journal of the Engineering Societies of New England* and to learn that Francis M. Staszkesy has been elected second vice-president and chairman of the Finance Committee. Frank is a past president of the Boston section of the American Society of Mechanical Engineers. Daytimes he may be found at the Boston Edison Company. George M. Illich, Jr., was recently named section manager of Chemical Engineering Development at the Abbott Laboratories (a pharmaceutical company). After receiving his bachelor's and master's degrees from Tech, George worked with the National Research Corporation for several years. He joined Abbott in 1946 as a chemical engineer, and later served as a development engineer until 1952, at which time he was named group leader of Development Engineering.

A long article in the *Sperry Engineering Review* tells us that Arthur A. Hauser, Jr., has been appointed assistant to the vice-president for research and development. In this new position his duties will include the co-ordination of present research and development activities and the formulation of long range plans for future research and development. Art joined Sperry in 1942 and has been with them ever since, except for a short period during which he taught mathematics at Rensselaer Polytechnic Institute. In 1955 he became head of the Digital Systems Engineering Department, assuming the responsibility for development of Transistorized Digital Computers for Military applications and for the development of numerical controls for machine tools. He is a member of Sigma Xi, the American Mathematical Society, the American Physical Society, the Institute of Radio Engineers, and the American Institute of Management. He has served for the past five years as chairman of the Advisory Committee for Mathematics at Adelphi College, where he is an associate trustee and a member of Advisory Council on Business and Industry. Richard C. Wynne has been appointed manager of the Orlando office of the Consolidated Electrodynamics Corporation. Prior to joining C.E.C. in 1955, he was a metallurgical engineer with the U. S. Naval Gun Factory. Stanley N. Golembe has recently been elected executive vice-president of Power Sources, Inc. This New England development company specializes in transistor inverters and other high precision

compact power supplies. Stan, Thelma, and their daughter, Carla, are residents of Brookline, Mass.

A postcard from Edward M. Redding tells us that he has just been appointed director of research of the R. R. Donnelley and Sons Company of Chicago, Ill. Dr. Redding was formerly director of research and development of the Crown Cork and Seal Company in Baltimore, Md. He is now living in Winnetka, Ill. The Esso Research and Engineering Company of Linden, N.J. has named Dr. William E. Catterall an engineering associate in the Chemicals Development Division. Prior to this appointment, Dr. Catterall headed the polymers section. He joined Esso in 1946 following his association with government research projects at the University of Pennsylvania. He is a member of the American Chemical Society and the American Institute of Chemical Engineers, and formerly served as chairman of the latter society's Research Committee. We note the recent promotion from commander to captain, U. S. Navy, of Theodore H. White. In receiving this promotion he moved from Annapolis, Md., to Fort Mason in San Francisco.

We are pleased to report the presentation of several scientific and engineering papers by members of our Class. Their names, subjects, and presentation conferences are as follows: Charles M. Lennahan, "New Thickness and 500—M.B. Height Normals for the Northern Hemisphere," at the National Conference on Upper Air of the American Meteorological Society; Norman L. Canfield, "Moisture Damage to Ships' Cargoes," at the first National Conference on Applied Meteorology; Peter J. Westervelt, "Energy Balance in Acoustic Streaming," at the Acoustical Society of America; Joseph Altman, "Acutance and Resolution," at the Society of Photographic Scientists and Engineers; and Milton M. Platt, "Relationship between Air Permeability and Structure of Woven Fabrics," at a joint meeting of the Fiber Society and the Textile Institute. In this last paper Milt discussed portions of four years of research at the Fabric Research Laboratories, where he studied for the Air Force the factors which affect the flow of air through fabrics, in an attempt to design parachute fabric structures possessing predetermined magnitudes of flow over wide differentials in pressure.

The family news department reports the arrival of Nancy Lynn Kraus on October 25. Bob and Mickey have two older children, Janet and Donald. Courtenay Crocker, Jr., has been living in Marblehead, Mass., since May, 1956. His present work is in experimental stress analysis work in the small Aircraft Engine Department of the General Electric Co. at the River Works in Lynn. A post card from Lieutenant Colonel Elwyn A. Moseley tells us that he is commander of the Third Weather Squadron headquartered at Shaw Air Force Base, South Carolina. His organization provides weather support to the Ninth Air Force of the Tactical Air Command and to some of the bases of the Continental Air Command. Richard H. Bridge, an architect practicing in Wakefield, Mass., has recently been very active as a district leader for their United Fund.

During the past several years, he has been associated with numerous local community activities such as the Red Cross, the Red Feather, the Y.M.C.A., and the Quannapowitt Council of the Boy Scouts of America. Richard and his wife Ruth have two children, two-year-old Cynthia and Douglas, who is just one month old. A perusal of the new M.I.T. catalogue yielded the information that Dr. Pauline Morrow Austin is now a research associate in the Meteorology Department and that Constantine John Maletskos is a member of the Medical Department serving as a radiation biophysicist in the Reactor Protection Office.

We regret to announce that the 15th Year Reunion Committee has received quite a few letters, post cards, and telephone calls reporting that the class pictures were very much delayed in shipment. We have discussed this at great length and sent the usual "lawyer's letter" to the Miller Studio in Hyannis. We have recently been assured that all pictures ordered last June were shipped by the end of October. If any reader of these notes knows of any class member who has not yet received his picture, please mail a post card to your Secretary so an immediate follow-up may be instituted.

The usual roundup of transcontinental moves shows five recent travelers. Earl R. Marble, Jr., has transferred from Eugene, Ore., to South Plainfield, N.J., where he is working for the American Smelting and Refining Co. Harry C. Maynard has been transferred west from Newport, R.I., to San Diego, Calif., where he is with the Guided Missile Evaluation Unit I of the Naval Air Station in North Island. Captain Richard L. Mohan has left Washington, D.C., for the Puget Sound Naval Shipyard in Bremerton, Washington. Louis E. Stouse, Jr., has come back east from Long Beach, Calif. He is now living in Winston-Salem, N.C. Owen W. Welles left Glastonbury, Conn., and is now with the Aerojet General Corp., in Azusa, Calif.

Moves of somewhat shorter distances have been made by Linwood P. Adams to Dallas, Texas; John R. Davis to Baton Rouge, La.; A. Paul L. Hotte to Indianapolis; Professor Milton Kaplow to Fort Lee, N.J.; Ferdinand Lustwerk to Park Forest, Ill.; Howard S. McCutcheon to Spokane, Wash.; Commander W. Moulton to Washington, D.C.; Albert H. Nagel to Albion, N.Y.; Robert E. Navin to the Applied Science Corporation in Princeton, N.J.; Walter J. Robbie to Warwick, R.I.; Daniel M. Schaeffer to Richmond, Va.; Raymond W. Shrewsbury to the Minnesota Mining and Manufacturing Company in St. Paul, Minn.; and George R. Urquhart, Jr., to Redington Beach in St. Petersburg, Fla.

All four of us wish you all a happy, healthy and prosperous New Year. — ED EDMUNDS in Albuquerque, BOB KEATING in East Alton, Ill., JACK QUINN in Hawthorne, Calif., and LOU ROSENBLUM, *Secretary-Treasurer*, Photon, Inc., 58 Charles Street, Cambridge 41, Mass.

## 1943

Stan Roboff of Sylvania-Corning Nuclear Corp. was a speaker at the fourth annual conference of the Atomic Indus-

trial Forum in New York in October; his subject was "Marketing in the Atomic Energy Industry." Harrison E. Cramer spoke on "A practical method for estimating Dispersal of Atmospheric Contaminants" at the National Conference on Upper Air of the American Meteorological Society in Omaha, also in October. Gilbert Monet was chairman of a symposium on "Adsorption Dialysis and Ion Exchange" and presented the introductory paper at the recent meeting of the American Institute of Chemical Engineers.

Bob Meissner of Chicago has been appointed chairman of our Class Special Gifts Committee, a group which has been formed to supplement the work of our class agent. The committee is made up of men in the major cities and will devote its efforts towards increasing our Alumni Fund contributions.

If the first reunion mailing has not reached you by now, you can blame only me. I don't think that the big affair will have to be sold to any of you, anyhow; our 10th reunion was indicative of the way we operate. Just reserve June 13 to 15, 1958, and let us worry about the details. — RICHARD M. FEINGOLD, *Secretary*, 49 Pearl Street, Hartford 3, Conn.

## 1945

As we missed the December issue due to the autumn house painting season, let me wish you all a pleasant last installment day (January 15) to the Internal Revenue people rather than belated Holiday Greetings.

I am, unfortunately, at the mercy of the Review Editors, as these notes were due today; and I was, again unfortunately but happily, deterred by George (Bud) Hetrick up in Hartford. As I had to be in the Hartford area for a few hours yesterday, I called G. B. a day early to make arrangements for lunch. Much to my surprise I was informed that our dashing debonair bachelor friend was to fall from his pinnacle of bachelorhood. Having departed from the "hood" several years ago, I know not how lofty Bud's pinnacle has been; but after dropping a couple of sawbucks I did learn he had been the University Club's pool champion these past three years. As you might expect, the pool led to evils of wine, no dinner with the wife, no notes on time, and an unstable head earlier today — it was fun, however!

The lucky girl is Norma Braun of Hartford and the newly married Hetricks should be settled in their West Hartford abode after a December in the Caribbean about the time these notes are distributed. While discussing newlyweds, your correspondent did receive notice of Vince Butler's plunge as anticipated in our last notes.

As you are all aware, news items come from a few varied sources. First, one can at times build a little story around an address change which the Alumni Association forwards to me periodically. Then we have the Institute News Service which, for example, has just forwarded a list of those Tech graduates who presented papers at the October meeting of the American Institute of Electrical Engineers — A. H. Scheinman, "A Numerical Graph-



ical Method for Synthesizing Switching Circuits." Third, a visit or brief note from another class officer, such as Dave Trageser stopping in the office at the time of the American Chemical Society meetings in September. The next source might be termed a field visit on my part, such as the Hetrick dissertation above. Then we have used from time to time in the past — none this month — pure and simple fabrication; obviously, this is not authentic reporting, but these fabrications usually bring forth a denial; hence we apologize two or three months later, which takes up space for which you guys pay me. The last source and most certainly the best and most authentic is a letter from a classmate who answers one of my many pleas for news — as, for example, Jim Barrabee's letter of late October quoted below.

"It seems we all have news to write about but it's awfully hard to sit down and finally put it on paper. [Editor's Note: How right you are!] Primary news is the arrival of a new son on August 9, 1957, a nice playmate for our daughter Lisa, who is now almost five.

"We are now stationed (if that's the word), still working for International Harvester Co., in Milwaukee, where I'm the quality control engineer for the foundry. I've been here two years now after working for the Manufacturing Research Division in Chicago for the previous five years. I'm active in the local section, as vice-chairman of the American Society for Quality Control and am also a member of the Industrial Engineering Committee of the American Foundrymen's Society. It's all fascinating work and I'm working with a swell group of progressive guys at the local plant.

"As you no doubt have heard, we had quite a time here as the 'home of the Braves,' and it was hectic a few weeks back. I don't believe many people have calmed down yet!!

"I haven't seen too many of the M.I.T. group here lately. Bob Pereles from Class of '49 lives across the street. Bill Schield '46 who is very active in the local section, is another Alumnus who graduated about the same time and was at school the same period I was.

"Not much else of importance, but at least I got this far, and it's an accomplishment for me. Regards, Jim Barrabee, 4907 N. Anita Avenue, Milwaukee 17, Wis." Many thanks for a nice letter, Jim. I think everyone will agree that a letter such as yours is the best type of news; I only wish I had more of them to use.

When Dave Trageser stopped by in September he indicated that he tried to reach Hal Thorkilsen over in Fanwood only to learn that Hal had been transferred from his job as warehouse superintendent for Colgate Palmolive in Jersey City to an executive sales position with Colgate in Chicago; although the Thorkilsens had not moved to the Midwest then, I presume they have relocated by now. Dave also indicated that fellow Phi Gam Pete Hickey would be forsaking the Boston area for Camden, N.J. Quite a contrast for such dyed-in-the-wool Bostonians as Pete and Lou, but most sensible when you consider Pete has been spending three or four days a week in Camden for the past couple of years. Randall D. Esten

was recently honored for his work at the U. S. Army Engineer Research and Development Laboratories in Fort Belvoir, Va. Randy is a section chief in the Map Compilation Branch, which performs basic and applied research for determining target co-ordinates for surface to surface missiles and for photogrammetric mapping, involving optical, mechanical, electronic, and analytical methods. The Estens live down by Hunting Creek in Alexandria, Va., just around the corner from where all the airline stewardesses stay in the Washington area, should any of you care to look him or them up or over.

Fellow naval architect Richard L. Canaday of New York City has joined Esso Research and Engineering as a patent attorney. Dick not only holds an S.B. from XIII but also an S.M. in mechanical engineering from Tech, as well as a law degree from St. John's University in Brooklyn. Prior to joining Esso, Dick was an administrative engineer with Intertype Corp. in Brooklyn for five years; he was also associated with the Los Alamos Scientific Laboratory and the Division of Industrial Cooperation at Tech. Fred Test delivered a paper on "A Study of Heat Transfer and Pressure Drop Under Conditions of Laminar Flow in the Shell Side of Cross-Baffled Heat Exchangers" at the Heat Transfer Conference held at Pennsylvania State University last August. I believe Fred is still a professor of mechanical engineering at Rhode Island State.

James P. Brown was recently appointed manager of the West Coast Operations for the Grand Rapids Division of Lear, Inc. Jim will continue as contracts manager in the area and, in addition, will administer field service activities. Jim started with Lear 11 years ago as a project engineer and test pilot on the first autopilot the company produced for jet fighters. Two or three weeks ago I spent a most enjoyable evening with Chuck and Jeff Buik and family up in Rochester. Chuck, as previously reported, after worldly travels with the Navy's Civil Engineers has settled in the Rochester area as general manager for E. E. Fairchild Corp., manufacturers of paper boxes and toys. From what I could gather the Buiks are real outdoor people, with the emphasis on hunting and skiing.

Unless you folks produce some news, probably I should wish you all a Happy Easter; but my hopes are high so . . . — CLINTON H. SPRINGER, Secretary, Firemen's Mutual Insurance Company, 420 Lexington Avenue, New York 17, N.Y.

## 1946

Our esteemed class treasurer, Edwin H. Tebbetts, one of the few remaining bachelors of the Class, is about to change his status. His engagement to Miss Priscilla Stebbins of Orangeburg, S.C., has recently been announced. The date has been set for December, so by the time you read this they should be Mr. and Mrs. Ned has also reported recently on the financial status of our Class. Prior to the 10th reunion we had \$104.55 in the treasury. Class dues and 10th reunion receipts brought in \$1217.50 and reunion expenses were \$721.87, leaving a treasury balance of \$600.18. Ned notes on the end of his

statement: "It might at first glance appear that the Class is carrying a balance which is considerably greater than is needed. However, since your Treasurer has certain responsibilities in connection with a 25th reunion gift to M.I.T., he has noted that the above sum is only a small percentage of the total gift the Class should make to M.I.T. in 1971. In recent years the gift presented on Alumni Day by the 25th reunion class has been in amounts of about \$50,000."

A number of our classmates have been active in the education and paper-writing field. Walter A. Backofen, associate professor of metallurgy at M.I.T., has recently given a series of lectures for the American Society for Metals, Boston Chapter, on the subject, "The Principals of Ferrous Heat Treatment." Thomas F. Malone recently gave a paper at the first National Conference on Applied Meteorology at Hartford, Conn., entitled "Whither Applied Meteorology in the United States?" Also, Alan R. Gruber, in conjunction with two other authors, gave a paper at the Heat Transfer Conference and Exhibit, sponsored by the American Society of Mechanical Engineers and the American Institute of Chemical Engineers, entitled "Control of Flow Sensitivity by Mixing Headers."

The University of Southern California School of Medicine recently announced that Bernard J. Haverback, M.D., a former investigator for the National Heart Institute, has been appointed assistant professor in the Department of Medicine. After graduating from M.I.T., Dr. Haverback went to Johns Hopkins School of Medicine where he earned his M.D. degree. He completed his internship at San Francisco Hospital and his residency at the Yale University School of Medicine in Grace-New Haven Hospital, Connecticut. His primary research is concerned with the physiology and disease of the gastrointestinal tract. Before his affiliation with the National Heart Institute, he was instructor of internal medicine at the University of Pennsylvania. He has written eight research papers in the field of gastroenterology. Another engineer gone wrong, Dr. Howard E. Hartman, writes from his office, Suite 104, Doctors' Gardens, Sarasota, Fla.: "Opened office for the practice of plumbing — technically termed urology — in the nicest town in the States. This is heaven — what with gorgeous climate, similar women, delightful fishing, alligator hunting, and a few sporadic oversized prostates." Well! Some people have all the luck.

José M. Corbella S. J. is professor of chemistry (physical chemistry) and head of the Chemistry Department at St. Xavier's College, Bombay 1, India. After graduation from Tech, Warren J. Grosjean worked for Gas Service, Inc., of New Hampshire as engineering assistant to the general manager. After a year and a half he went to work for General Electric as an engineer. He soon became a quality control engineer and is now supervisor of quality control engineering for the Clock and Timer Department in Ashland, Mass. Warren married a Montreal girl in 1952 and they now have two sons, Warren and Wayne. He has had an article published recently on quality control in *Machine*



**Design.** Robert C. Urquhart is a member of Korea Mission, Board of Foreign Missions, Presbyterian Church in U. S. A. His present assignment is Presbyterian Mission, #1 Nam San Dong, Taegu, Korea. He is also President of Kyung Suh Bible Institute. Bob is married and has one daughter.

Daniel Cooper earned his Ph.D. in physics from M.I.T. in 1952, worked for two years for Bell Telephone Laboratories, and now is managing editor of *Nucleonics Magazine*, the McGraw-Hill publication in the atomic energy field. Dan and Bette and the two children live at 100 Franklin Street, Morristown, N.J. Frank M. Verzuh earned his Sc.D. degree in 1952 from M.I.T. and became director of the Office of Statistical Services, M.I.T. He is now assistant director of the new M.I.T. Computation Center, and is engaged in research in computing and in teaching computation courses. He is chairman of the American Institute of Electrical Engineers Information Data Processing Committee, and Association Computing Machinery representative to the Eastern Joint Computer Committee. In his work he has traveled widely, visiting computation centers in Denmark, Sweden, France, England, Holland, and Belgium. His article "Solution of Boundary-Value Problems on Automatic Computing Equipment" appeared in *Communications and Electronics* in January, 1954. Frank was married to Miss Edna H. Tamm of Quincy, Mass., in the new M.I.T. Chapel in October, 1955.

Donald and Martha Wallace write from their home at 115 East 72nd Street, New York 21, N.Y. He is an associate lawyer with the firm of Clark, Carr, and Ellis in New York, engaged, for the most part, with corporate law. Robert F. Hoffman is assistant manager of foundries for Worthington Corp. of Harrison, N.J. His job is to assist in the supervision and operation of three foundries — iron, brass and steel — employing approximately 500 people. He directs activities such as production, plant layout and improvement, purchase of new equipment, and safety program. He is active in his church, now serving as president of the couples' club with a 330 person membership. He has produced and directed several minstrel shows for the benefit of the church. Six months before their marriage, he and Marion started to build their own home. They moved in a year and a half later, and worked two more years to really finish the job. If they ever decide to move from 18 West Lane, Madison, N.J. and build another house, they will have three assistants in Larry, 7; Greg, 4; and Skipper, 2. Sadettin Güntürkün is a Lieutenant Colonel in the Turkish Air Force, and is director of aircraft maintenance at the Eskisehir Supply Center. He is married, has two children, and lives at İkmal Merkezi, Eskisehir, Turkey. Howard, Doris, Steven, and Susan Auerswald live at 65 Rogers Avenue, West Springfield, Mass. Howard is president of the Tubed Chemicals Corp., 2 Pine Street, Easthampton, Mass.

E. H. (Ned) Bowman received his M.B.A. from Wharton School, University of Pennsylvania, and his Ph.D. from Ohio State University. After three years of

teaching at Ohio State he became assistant professor of industrial management at M.I.T. in the School of Industrial Management. In addition to numerous consulting assignments, he has authored a number of articles in professional journals and coauthored a book entitled *Analysis for Production Management*, published by R. D. Irwin, Inc., in February, 1957. Last year we mentioned "Stanley" Goldstein in this column, gave him a real fine plug, mentioning his architectural and engineering offices at 25 Halsted Street, East Orange, N.J. Do you think he appreciated it? No sir! Even though he was overloaded with new business as a result of the plug he managed to write a nasty note in rebuttal. Seems as if he is very sensitive about the name Stanley. He says that if Curt Canfield and the Chief of Naval Operations can call him Jim then he would think that his old classmates could do so, too. Let me take this opportunity, then, to caution all who read this that the next time they bump into old Stan, call him Jim. See you next month. — JOHN A. MAYNARD, *Secretary*, 15 Cabot Street, Winchester, Mass.

## 1947

After reading Claude Brenner's most complete coverage of the 10th reunion activities, your Correspondent feels somewhat remiss in not being able to come up with something comparable this month. As you know, or may surmise, all or most of the personal information in this column comes directly from you. From news releases, the following information has been gathered about members of the Class. Richard R. Hydeman, Course X, has been elected vice-president in charge of manufacturing for the Taylor Fibre Company of Norristown, Pa.; he has been with the Company for some time. His wife and two daughters complete his immediate family. In a literary vein, several of our boys have indicated their prowess recently; Edward E. David, Jr., was coauthor of a paper on high-frequency wave forms, which was presented at the last meeting of the Acoustical Society of America at the University of Michigan. Herbert S. Isbin was also a partner in presenting a paper on "Natural Convection Heat Transfer in Regions of Maximum Fluid Density," at the Heat Transfer Conference held at Pennsylvania State University. Henry Lee has coauthored a book on applications and technology of epoxy resins.

Commander Kenneth M. Tebo, who received an advanced degree in Course XVI, has been appointed second officer of the U. S. S. *Albemarle*, the Navy's newest seaplane tender. At present, he resides in Arlington, Va., with his wife and three children. Robert E. Savage, also a graduate degree member of the Class, has been placed in charge of the Distributor Sales Section of the Nickel Department of the International Nickel Company. — ARTHUR SCHWARTZ, *Secretary*, 176 South Harrison Street, East Orange, N.J.

## 1948

News for the January issue comes mainly from the clipping services, and it is not voluminous this month. We still

need frequent letters from members of the Class in order to make full use of the class notes as a means of keeping us all informed about one another.

Radio Corporation of America announces the appointment of George G. Hoberg to the newly created position of manager, Special Data-Processing Equipment Engineering. He was formerly associate director of engineering for the Burroughs Corp. in the data-processing field.

Bernie Gordon, who is President of Epsco, Inc., in Boston, spoke to the Connecticut Valley Section of the Institute of Radio Engineers on October 17. The subject was "High Speed Data Handling," which was a natural for Bernie since his company is in the field of computers and high speed instrumentation. The story of Bernie's success in the electronics field is a fascinating one and perhaps, if he reads this class note, he will oblige me, his former roommate, with a suitable letter which I can include with the class notes covering much of the interesting development of his company.

The American Meteorological Society held its first National Conference on Applied Meteorology on October 28 and 29 in Hartford, Conn. Our Class was represented by George F. Collins and Glenn R. Hilst. George spoke on "Du Pont's Tide and Storm Warning Service," and Glenn presented a paper on "Meteorological Phases of Air Pollution Problems Associated with the Operation of the Hanford Works."

Also presenting a paper in 1957 was Sidney Lees, at the June meetings of the American Society for Engineering Education at Cornell University. His subject was "Mathematical Practice in Control Engineering."

Arthur Denues, deputy director of the Sloan-Kettering Institute for Cancer Research, spoke at the annual meeting of the Connecticut Division of The American Cancer Society on October 23, 1957. His subject was "Toward Control and Cure."

We still get an occasional notice of marriage for one of our class members, and we're happy to report that Bill Maley has acquired a wife in time to take her to the 10th reunion! Bill married Miss Elisabeth Jennings on October 26, 1957, at the Winchester Unitarian Church. Among the ushers we notice the name of classmate George Macomber. Bill and his bride will be living in New Haven, Conn.

Plans are moving forward on the Tenth Year Class Profile, first mentioned in these notes last May. Our plan is to have the Profile ready for distribution by reunion time in June. You should receive very soon two questionnaires: one will ask for brief biographical notes and current statistics about your family, address, and business; the other, to be returned unsigned, will ask for personal, educational, vocational, and financial information. The best way for each member of the Class to share in preparing the Profile is to fill out the questionnaires and return them — pronto! Information about how you can sign up to receive a copy of the Tenth Year Class Profile will be forthcoming shortly. — R. H. HARRIS, *Assistant Secretary*, 26 South Street, Grafton, Mass. WILLIAM R. ZIMMERMAN, *Secretary*, 6819 McEwen Road, Dayton 59, Ohio.

I trust that you all have had a most happy Christmas and that Dad has finally allowed Junior to play with the trains that Santa brought on Christmas Eve. For all of you who may not have received cards from us, we wish to extend a belated happy Yuletide and our best wishes for a happy and successful New Year.

Robert Cantwell has been appointed a development engineer in applied research and advanced development at the Oswego plant of International Business Machines Corporation. Bob joined I.B.M. in September, 1951, as a design engineer. Bob, his wife, Ethel, and their three children are now living in Johnson City, N.Y.

The board of directors of Technology Instrument Corporation of Acton has named Hollis L. Gray, Jr., of Lexington as vice-president of the corporation. Hollis has been with the firm for six years.

Gerald G. Fisch has been named a vice-president of Bruce Payne and Associates, Inc., management consultants. Gerry, who joined the company in 1955 and became an assignment director in 1956, was formerly with Canada Packers, Ltd. He also served as vice-president and general manager of a leading consulting firm in Canada. In his new position he will maintain headquarters in the firm's New York office and will co-ordinate activities of the firm's area offices in Boston, Chicago, Atlanta, Montreal, and Westport, Conn. Gerry and his wife, the former Jean Eleanor White, reside in Darien, Conn.

Howland A. Larsen received his Ph.D. in chemical engineering at the University of Illinois this year and joined the staff of Du Pont's Polychemicals Department, research division, during the summer.

Dr. John H. Litchfield was appointed to assistant professor of food engineering at the Illinois Institute of Technology this fall. John went to Illinois Tech from Swift and Company, where he was a research food technologist. He has worked for the Searle Food Corp. and was food advisor to the major commands in the United States Army here and in Germany from 1950 to 1953. He received his master's degree and his Ph.D. at the University of Illinois. His fields of advanced study include microbiology, food and nutritional biochemistry, and industrial management.

Fred Lorenzen, Jr., has been appointed assistant professor of mathematics at Union College in Schenectady, N.Y. Fred has been engaged in graduate work at the University of New Hampshire since 1955 and was awarded his M.S. degree this year. Prior to this appointment, Fred had taught at the Manlius School in Manlius, N.Y., and at Tilton Academy in Tilton, N.H. He has been associated on other occasions with the Raytheon Manufacturing Corp. and with International Business Machines Corp.

Leonard Smith has joined the Union Carbide and Carbon Corporation, and is working in the management services department. Johnson and Johnson Company has named Floyd L. Wideman as director of its New Products Division. He joined Johnson and Johnson as a baby product director in 1954. Prior to that time, he had been associated with Procter and

Gamble and Gray Advertising Agency in New York City. He is married to the former Lois Gumas of Cleveland and they reside in Princeton, N.J.

A letter from Leo Sartori of Princeton University brings some glad tidings from Course VIII: "After getting my Ph.D. from Tech, I spent a year at Brookhaven Laboratory and came to Princeton in the fall of 1956, as an instructor. The ivy is a little thick, but on the whole it is very pleasant here. I'm doing research in high energy physics. I'm still single with no immediate prospects of changing that state. Some news of other physicists: Harrison White is now an ex-physicist, having gone into sociology. He is an assistant professor at Carnegie Tech. Kerson Huang has been at the Institute for Advanced Study for two years and is back at M.I.T. as an assistant professor. He is also married. Bruce McCormick got his Ph.D. from Harvard and has been at Brookhaven for two years. He is married and is a father, too."

At the 54th meeting of the Acoustical Society of America, held at the University of Michigan in October, two of our classmates delivered technical papers. James L. Flanagan was coauthor of a paper entitled "Pitch Discrimination for Synthetic Vowels." Charles H. Sherman's paper was "Dynamic Mechanical Stability in the Variable-Reluctance and Electrostatic Transducers." Edward Cohen and Hoyt C. Hottel<sup>24</sup> delivered a paper entitled "Radiant Heat Exchange in a Gas Filled Enclosure" at the Heat Transfer Conference and exhibit cosponsored by the American Society of Mechanical Engineers and the American Institute of Chemical Engineers, given in August at Pennsylvania State University. The Audio Engineering Society is sponsoring a group of lectures on the Principles and Practices of Tape and Disc Recordings at the Radio Corporation of America Institutes, Inc., in New York City. Stephen Temmer, now with the Gotham Audio Development Corporation, has given one of these lectures which deals with the necessity of proper interrelation between recording machines and the audio components used for control in recording facilities systems. Stephen also gave an address to the ninth Annual Convention of the Audio Engineering Society in October. The title of the talk was "Principles and Problems of Stereophonic Transmission."

Gerald Farnell, now a professor at McGill University, has invented an electronic slide rule that comes up with answers to tedious math problems within a minute. It is being used by the United States Air Force for a long-term radar study.

Le Roy Barnum received his master's degree in chemical engineering at New York University this summer. Roy is married to the former Pauline Miller and they have one son, Donald Paul, who is now three years old.

Some notes received from classmates follow. Raymond Hawes: "Have transferred from Winchester Division of Olin Mathieson Chemical Corporation, New Haven, where I was manufacturing superintendent of ammunition plant, to Ramset Division of Olin in Cleveland, Ohio, as product engineer superintendent. Have

been with Olin since graduation. Married Betty Nelson of Hamden, Conn., on April 24, 1954, and have one son, Gary, who was born in October, 1955." From Frank Kayser: "Have returned to M.I.T. for doctorate work in metallurgy. Spent the last two years very pleasantly at the scientific laboratory of Ford Motor Company in Dearborn, Mich."

Stanley Martin, Jr., has been sent by Bell Helicopter Corporation to work with Giovanni Augusta Company in Gallarate, Italy. He will be there for about a year, and he was able to lease a villa for himself and family overlooking beautiful Lake Maggiore. John MacMillan writes: "Have moved wife and three daughters from Seattle, Wash., to Lynchburg to accept new job with Atomic Energy Division of Babcock and Wilcox Company."

John T. Reeves has accepted a fellowship in cardiology at the University of Colorado Medical Center for one year.

A note from David Forrest's father tells us that Dave served his country in Korea and was reported missing in action. There has been no word, so Dave is now assumed deceased.

After spending four years at Molusi College in Nigeria, Africa, Don and Louise Eberly are now in Turkey. Don is teaching at Roberts College in Istanbul. Mariano Romaguera is working for the Ingenio Providencia in Colombia, South America as mechanical engineer in charge of construction and erection of new plan and equipment. Nano and Virginia have two little ones running about their home, and they are José Mariano, three years old, and Jorge Enrique, one year old.

Bob and Helen Wohler join the magic five group with the announcement that Karl Patrick, a hefty 9-pound-15-ounce boy, arrived on May 25, 1957. That makes two boys and three girls for the Wohlers, who are living in Norwood, Mass. Another couple to join the magic fives are Jim and Jean Lydon, who announce the birth of John David, another big fellow weighing in at 10 pounds, 1½ ounces on August 14. The new addition joins Richard, eight; Carol, seven; James, Jr., five; and Joseph, who is now two. Jim is still with Boston Edison Company, and the family resides in Waltham.

The regional secretary plan is still a little bogged down but a break through will be arrived at shortly. Keep the mails full. — JOHN T. WEAVER, Secretary, 24 Notre Dame Road, Bedford, Mass.

## 1956

Most of you have received your 1958 Alumni Fund letter. There were few participants from this Class in last year's fund group, so get out and rustle up some of those who do not receive The Review.

The world has been astir over the appointment of Dr. Killian as the President's assistant for scientific effort. The duties of this office are not clearly defined but undoubtedly will not be czaristic in character. Most likely Dr. Killian's task will be to eliminate the petty jealousies and needless duplications that so often occur in government work. We of the Institute family are loath to release the head man, but we think the choice was excellent.

In these days of strong national unions,



many times the hourly man earns more than a young engineer. This is strong encouragement for professional unions to gain benefits like overtime pay, job security, and improved working conditions. With these advantages, however, come promotion only by seniority and regimentation by union officials. Departing from the material side of the question, it is one man's opinion that it is a little more difficult to see the company's point of view when embroiled in union activities. As a professional man it seems to be limiting one's future and advancement in an individualistic society. Consider, too, if most engineers belonged to a national union it would be only one step to nationalization. Let us hear some of your thoughts on this topic.

Weddings and engagements this month include Charles Berg's betrothal to Leslie Dineen of Barre, Vt., last September; Charles Joyce's engagement to Nancy Shields of South Boston last fall; William Layson's wedding to Deane Meredith Allen of Westfield, N.J. in July, 1957; David Mellen's engagement to Judith Eileen Spiegel of Laurelton, Long Island, N.Y., in August; David Palamountain's wedding to Nancy Hall Myers of Port Washington, N.Y., in November, 1957; and Graydon Wheaton's wedding to Iris Glenn Ellis of Belmont in September.

Kenneth Jones became an instructor in chemistry at Thayer Academy in Braintree this fall. You chem. engineers will find John Bacon's name on the masthead of Chemical Engineering. Lieutenant Richard Shopf is in Navigation School at Ellington Air Force Base, Houston, Texas, but expects to be transferred to Waco, Texas soon. George Brattin has completed Officer Candidate School at Newport, R.I., and is now in underwater demolition work at Key West, Fla. Of course we are aware that Julio Arroyo is at Aberdeen Proving Ground.

Warren Briggs has completed his six months' tour and is now at Harvard Business School.

Next month we will look in on the whole man while he indulges in other than professional activities. — **BRUCE B. BREDEHOFT**, *Secretary*, 1528 Dial Court, Springfield, Ill. **M. PHILIP BRYDEN**, *Assistant Secretary*, 3684 McTavish Street, Montreal, P.Q., Canada.

## 1957

Roger Yaseen is back in the states after a four month trip around the world. To celebrate his return, Roger's sister, Barbara, threw a surprise party for him at Wellesley College where Barbara is en-

rolled. Roger spent several weeks in New York, then moved on to California, where he intends to work. Andy Blackman is moving across the continent of Europe faster than this column can record. His postcards are postmarked England, Denmark, France, Belgium, and so forth. Andy is spending the winter in Italy, where he is studying the local architecture.

Don Park writes from the compressor capital of the world: "I am presently engaged in production work for Ingersoll-Rand at Painted Post, N.Y. Living at the Imperial Club is a real bargain; room plus 10 meals at \$15.00 per week! Even Baker House was never that good! All in all, the work is fascinating, the people are great, and there are enough problems to keep us all very busy. I have been hearing quite frequently from Bob Currie. He has settled at Batelle Memorial Institute and reports that he is the owner of a 'new' T.C. M.G. Bob is working on several secret government projects."

Michael Pick is with Grumman Aircraft at Bethpage, N.Y., as an aerodynamics engineer. Mike has undertaken graduate work at Brooklyn Polytechnic Institute on his M.S. in aeronautical engineering. Next May, Mike joins the Corps of Engineers at Fort Belvoir as a second lieutenant for two years. Mike says that he is currently single with "no plans, but great expectations." Jarda Polak is with AMF Atomics, Canada, Ltd., at Port Hope, Ontario, as a metallurgist. Terence Porter has received a teaching assistantship at the University of California, Berkeley, where Terence is working on his Ph.D. in physics. Garry Quinn '56 is with the Atomic Energy Commission in Washington, D.C. Garry and his five roommates have a specious apartment, and Garry has been serving as Chamber of Commerce to many visiting M.I.T. firemen in the Washington area. Its Mercury in 1958 for Philip Richardson, who is a member of the Merchandising and Product Planning Office of Mercury Division, Ford Motor Co. Marc Richman has become a part time instructor at Tech as he works for his Sc.D. in physical metallurgy.

Marriages: I made too brief mention in the November issue of Stewart Crawford's wedding to Doris Young of Belmont last June 8, as I didn't have the details then. Many of the Sigma Phi Epsilons were in attendance, and Lloyd Sutfin and John deVerrier served as ushers. The couple honeymooned in Quebec and are now living in Newtonville. Another June wedding was that of Clifford W. Cain, Jr., to Amy Ella Purrington. Cliff and Amy honeymooned in Maine and are now liv-

ing in Niagara Falls, where Cliff is a chemical engineer for the Electrometallurgical Co. Theodore Zachs was wed to Elaine Bernstein of West Hartford, a Simmons student. Having completed a motor tour of the U. S., the Zachs are now living in Boston.

Recording the doings of the Chi Phi could occupy an entire article in itself. Jim Chorak took as his bride Gwendolyn Nelson of Amherst, Mass. This wedding was a smashing success for the M.I.T. Placement Bureau, as it seems that Jim met Gwen through the Placement Bureau, where Gwen was formerly employed. In the capacity of best man was Chi Phi Jack Currie, while Harry Johnson served as an usher. The honeymoon took in Maine and Canada, and Jim is now with the Air Force. Harry Johnson married Ann Hanonway last July and is now finishing six months with the Ordnance Corps at Aberdeen. After military service, Harry expects to study finance and investments at the University of Michigan while working on his M.S.

The Class of '57 has set a record! Toni Deutsch writes to say that we made money Senior Week. Toni backed up her statement with a check for \$95.53. Ours is the first class to make money on Senior Week in the memory of modern man, and the credit for this achievement belongs to Ron Enstrom and his Senior Week Committee. Many suggestions have been advanced as to how to dispose of this money. One boozier suggested a bar credit at the Faculty Club in order that '57 could drink its profits up at reunion time. Several men recommended adding the money to the scholarship fund. But the idea now prevailing is to spend a portion of the fund on putting out a class directory of names and addresses to be distributed to each of you and to reserve the remainder of the fund to meet the initial charges of the 5th year reunion.

By the time you read this I will have left Bankers Trust Company, New York and Wall Street, and commenced six months with the Chemical Corps, Fort McClellan, Alabama. It gives me great pleasure to report that Marty Forsburg has agreed to serve as assistant class secretary. For those of you in the Boston area and at Tech it should facilitate contact with your class representatives, for Marty is working at the Instrumentation Laboratory, M.I.T. Write either of us. — **ALAN M. MAY**, *Secretary* (please write Second Lieutenant) Student Detachment, the Chemical Corps School, Fort McClellan, Alabama. **MARTIN FORSBURG**, *Assistant Secretary*, 8 Forest Street, Cambridge, Mass.



FORMALDEHYDE • CHARCOAL  
 MAGNESIUM • CAPROLACTAM  
 UREA PRILLING • ISOBUTANOL  
 MELAMINE • ACETIC ANHYDRIDE  
 NITRIC ACID • METHANOL  
 CHLORINE • DYNAMIDE  
 STEARYL • PIC ACID  
 SULFUR • NITRATE  
 METHYL • COHOL  
 ISOPROPYL • THANE  
 PHOSPHORIC • C ACID  
 ACRYLIC • ILORITE  
 DICYANDIAMIDE • SULFATE  
 HYDROGENAZIDE • TIC POTASH  
 CALCIUM CARBIDE • AMINES  
 FATTY ACIDS • ACETALDEHYDE  
 DICHLORODIFLUOROMETHANE  
 MERCURY CELL CAUSTIC SODA  
 AMMONIA • CARBON BISULFIDE  
 POLYVINYLACETATE <sup>AND</sup> CHLORIDE  
 NITROPHOSPHATE FERTILIZER

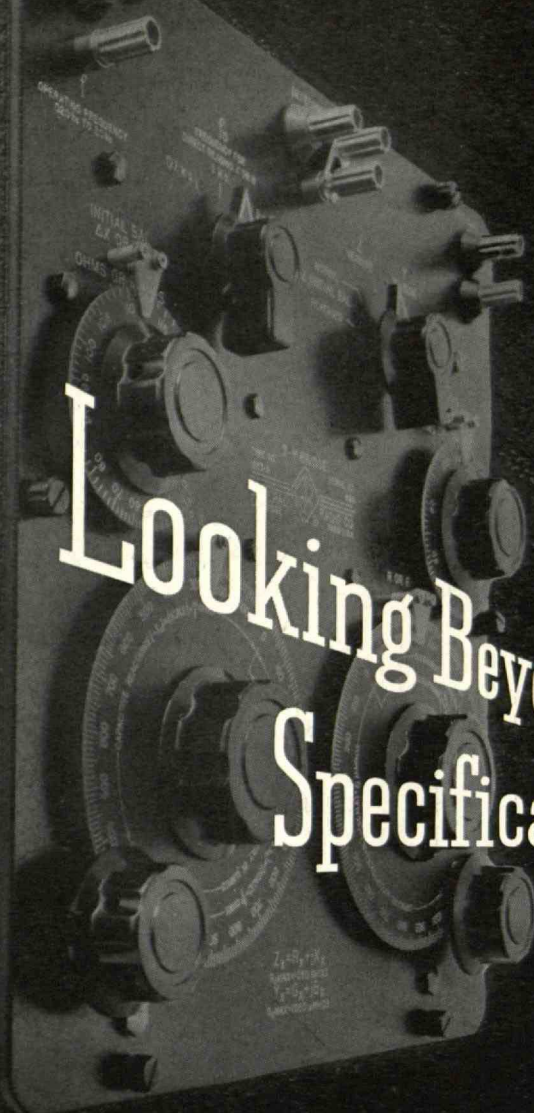


CHEMICAL  
 PROCESS  
 DESIGN

THE **UHDE CORPORATION**

350 FIFTH AVENUE, NEW YORK 1





# Looking Beyond Specifications . . . . .



## Specifications

never tell the complete story. Quality, for example, is not included, because it cannot be measured, only evaluated. Quality is made of many things — the engineer's approach to the design problem and how well he solves it . . . the workmanship that translates his thoughts into reality . . . the care and individual consideration given each product during calibration to assure exceptional performance . . .

Adherence to these principles requires that all concerned with the instrument's creation be dedicated to *Quality* — the intangible specification which at General Radio guarantees that *every instrument is built to last*. Since 1915, the General Radio trademark has been a hallmark in the electronics industry. Behind it stands a company that has consistently produced the finest in electronic test equipment; a firm where Quality began as a principle, and has become a tradition.

## GENERAL RADIO Company

275 Massachusetts Avenue, Cambridge 39, Mass., U.S.A.

Broad Avenue at Linden, Ridgefield, N. J. **NEW YORK AREA** 1000 N. Seward St. **LOS ANGELES 38**

8055 13th St. Silver Spring, Md. **WASHINGTON, D. C.**

1150 York Road, Abington, Pa. **PHILADELPHIA**

1182 Los Altos Ave., Los Altos, Calif. **SAN FRANCISCO**

6605 W. North Ave., Oak Park, Ill. **CHICAGO**

In CANADA: 99 Floral Parkway, **TORONTO 15**

